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November 8, 2002
DCN 0

POES IJPS

Polar-orbiting Operational Environmental Satellite (POES)

Ground Segment
Command and Data Acquisition Station (CDAS) and Satellite Operations Control Center (SOCC) Requirements for the IJPS

November 2002

Prepared by:

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)

NOAA/NESDIS

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Approval Page

Document Numbers: **NOAA/NESDIS** *POES Series* **P219**	**NOAA-POES-IJPS/OSD-2002-0010R0UD0** **November 8, 2002** **DCN 0**

Document Title Block:

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PROGRAM: POES IJPS	**DOCUMENT RELEASE DATE:** November 8, 2002

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Document Change Notice

DCN NO.: **0**	DATE: **November 8, 2002**	PROGRAM : SYSTEM: **POES : IJPS**	PAGE NO.: **1** of **1**

DOCUMENT TITLE: ***Polar-orbiting Operational Environmental Satellite (POES) Ground Segment Command and Data Acquisition Station (CDAS) and Satellite Operations Control Center (SOCC) Requirements for the IJPS***

DOCUMENT NO. **NOAA-POES-IJPS/OSD-2002-0010R0UD0**

CHANGE PAGE HISTORY			
No.	Page Number(s)	Update Instructions (Insert / Delete / Replace)*	Reason for Change
0	Complete Document	Original baseline version of this document	As presented at the NOAA SRR and updated to reflect all Review Item Discrepancies from the SRR Review Board.

COMMENTS: This is the first publication of this document; as such, it comprises the DCN 0 baseline.

NOTES:

*EXAMPLES: An *Insert change pages 6.2-6 through 6.2-9 following page 6.2-5* A *Replace pages 3.4-1 through 3.4-10 with change pages 3.4-1 through 3.4-10b* A *Replace page 4.5-24 with change page 4.5-24; delete pages 4.5-25 through 4.5-30*

Version Description Record

DOCUMENT TITLE:
Polar-orbiting Operational Environmental Satellite (POES) Ground Segment Command and Data Acquisition and Satellite Operations Control Center (SOCC) Requirements for the IJPS

DOCUMENT NUMBER: Baseline: NOAA-POES-IJPS/OSD-2002-0010R0UD0	SYSTEM: POES IJPS	DOCUMENT BASELINE ISSUE DATE: November 8, 2002

DOCUMENT CHANGE HISTORY					
DCN No.	Revision/Update Nos.	Date	DCN No.	Revision/Update Nos.	Date
0	R0UD0	November 8, 2002			

NOTES:

Preface

This document comprises the NOAA/NESDIS baseline publication of the *Polar-orbiting Operational Environmental Satellite (POES) Ground Segment Command and Data Acquisition Station (CDAS) and Satellite Operations Control Center (SOCC) Requirements for the IJPS*. This document is Revision 0, DCN 0 (document number NOAA-POES-IJPS/OSD-2002-0010R0UD0).

This document identifies requirements for the NOAA CDAS and SOCC elements of the POES Ground Segment for IJPS. The intent is to provide a baseline for future upgrades needed to perform Metop satellite-related functions required to sustain the joint NOAA/EUMETSAT system called the Initial Joint Polar-orbiting Operational Satellite System (IJPS).

Publication of this document closes Document Configuration Change Request (DocCCR) # DocCCR-POES-Other-2002-0008, entitled *Acceptance of Ground Segment Command and Data Acquisition and Satellite Operations Control Center (SOCC) Requirements for IJPS*.

Future updates and revisions to this document will be produced and controlled by NOAA/NESDIS.

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Acronyms

AD	Applicable Document
AIP	AMSU Information Processor
AMSU	Advanced Microwave Sounding Unit
ASCAT	Advanced Scatterometer
CDAS	Command and Data Acquisition Station
CE	Communications Element
CGS	Core Ground Segment (EUMESTAT)
COTS	Commercial-off-the-shelf
CR	Common requirements
CSU	CDA/SOCC upgrade
DCS	Data Collection System
EPS	EUMETSAT Polar System
EU	Engineering unit
EUMETSAT	European Organisation for the Exploration of Meteorological Satellites
FCDAS	Fairbanks Command and Data Acquisition Station
GAC	Global Area Coverage
GDS	Global Data Stream (Refers only to the X-band data from Metop satellite)
GOME	Global Ozone Monitoring Experiment
GRAS	Global Navigation Satellite System Receiver for Atmospheric Sounding
HIRS	High Resolution Infrared Sounder
HRPT	High Resolution Picture Transmission
IASI	Infrared Atmospheric Sounding Interferometer
IJPS	Initial Joint Polar-orbiting Operational Satellite System
ICD	Interface Control Document
IPS	Ingest and Preprocessing System
JORP	Joint Operations Rules and Procedures
LAC	Local Area Coverage
LRU	Line Replaceable Unit
Metop	Meteorological Operational Satellite
MHRPT	Metop HRPT
MHS	Microwave Humidity Sounder
NOAA	National Oceanic and Atmospheric Administration
NRZ-L-PSK	Non Return to Zero-L Phase Shift Keyed

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PGS	Polar Ground Segment
POES	Polar-orbiting Operational Environmental Satellite
QPSK	Quadrature Phase Shift Keyed
RF	Radio Frequency
SAIP	Stored AIP
SARSAT	Search and Rescue Instrument
SATCOM	Satellite Communications
SBUV	Solar Backscatter Ultra-Violet Spectral Radiometer
SOCC	Satellite Operations Control Center
SCR	System Commissioning Review
SCT	Stored command table
STIP	Stored TIP
TBC	To Be Confirmed
TBD	To Be Determined
TBW	To Be Written
TC	Telecommand
TIP	TIROS Information Processor
TM	Telemetry
UTC	Universal time code
VCDU	Virtual Channel Data Units
V&V	Verification and Validation
WCDAS	Wallops Command and Data Acquisition Station

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1. Introduction

The National Oceanic and Atmospheric Administration (NOAA) has entered into an agreement with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) for participation in the Initial Joint Polar-orbiting Operational Satellite System (IJPS) (hereinafter referred to as the "IJPS Agreement"). In the IJPS Agreement, NOAA and EUMETSAT agree to procure and operate their Polar-orbiting satellites in a manner beneficial to both parties and the world's meteorological community.

The IJPS consists of two independent, but fully coordinated, polar satellite systems: the NOAA Polar-orbiting Operational Environmental Satellite (POES) system and the EUMETSAT Polar System (EPS). In support of the IJPS, NOAA satellites NOAA N and N′ will be flown consecutively (one replacing the other) in a polar orbit with an afternoon (P.M.) equatorial crossing time. NOAA N and N′ will be the IJPS POES satellites. EUMETSAT, working together with the European Space Agency (ESA), will develop the Meteorological Operational Satellite (Metop) series to be flown consecutively in a Polar orbit with a morning (A.M.) equatorial crossing time. The Metop satellites comprise the space segment of the EUMETSAT Polar System. The morning and afternoon satellites will embark a set of jointly provided common instruments. In addition, instruments specific to each orbit will be provided by NOAA and EUMETSAT for their respective satellites. The IJPS Agreement also commits NOAA and EUMETSAT to provide support for each other's operational satellite through their respective ground segments for commanding, receiving telemetry and global data, as well as exchanging data between the two Polar satellite systems. IJPS begins with the commissioning of the first Metop satellite to be launched.

POES is a long-standing operational satellite system. The POES Ground Segment (PGS) currently operates and generates meteorological products from POES satellites. Among other components, the PGS includes two Command and Data Acquisition Stations (CDAS) and a Satellite Operations Control Center (SOCC). The CDASs provide commanding access to the POES satellites and acquisition of POES telemetry and meteorological data. They are located at Wallops, Virginia (WCDAS) and Fairbanks, Alaska (FCDAS). The SOCC is the center of POES satellite operations and is responsible for command and control of the POES spacecraft and instruments. The PGS, including the CDASs and SOCC, must be upgraded in order to fulfill NOAA's commitments to IJPS.

Until NOAA N becomes operational, pre-IJPS NOAA satellites will provide the instrument data for the meteorological community. After the launch of NOAA N, residual POES satellites will still be operated by the PGS. Support functions to these non-IJPS satellites will continue into the IJPS timeframe.

1.1   Purpose

The purpose of this document is to establish the requirements for the CDAS and SOCC modifications necessary to meet the PGS IJPS requirements.

1.2   Scope

This document only addresses capabilities not already provided by the existing CDASs and SOCC.

1.3   Document Organization

Section 1 provides the background, purpose and document structure. Section 2 provides a brief description of CDAS and SOCC elements and planned modifications for IJPS operational support. Section 3 provides requirement statements for IJPS CDAS and SOCC upgrades. Section 4 covers keywords and definitions. Section 5 identifies open issues. Appendix A provides a Requirements Matrix.

1.4   Applicable and Reference Documents

Table 1-1 presents a list of applicable documents (AD-#) from existing requirements and operations documents. The applicable documents form a part of this specification to the extent specified.

Table 1-1. Applicable Documents

Doc #	Title	Reference Number	Issue	Date
AD-14	EPS/NOAA Joint Operations Rules and Procedures	NOAA-POES-IJPS/OSD-2001-0004R0UD0	1.0	11/30/01
AD-15	NOAA Ground Segment to EPS Ground Segment Interface Control Document	To be written (TBW)		
AD-16	Metop Space to Ground Interface Specification	MO-IF-MMT-SY0001	5	10/17/00
AD-21	Interface Requirements between CDAS, SOCC, and Ingest and Preprocessing System (IPS) in the IJPS Era	NOAA-POES-IJPS/OSD-2002-0016R0UD0	DCN 0	11/8/02
AD-22	POES IJPS System Requirements for Communication Services	NOAA-POES-IJPS/OSD-2002-0006R0UD0	DCN 0	10/30/02

Reference documents (RD-#) in Table 1-2 provide additional useful information for program implementation.

Table 1-2. Reference Documents

Doc #	Title	Reference Number	Issue	Date
RD-2	NOAA Baseline Polar Orbiting Environmental Satellite (POES) Command and Data Acquisition (CDA) and Satellite Operations Control Center (SOCC) Equipment Configuration	NO-IJ/SO-99-0008R0U0	#2	11/30/99
RD-4	NOAA IJPS Communications Architecture Study	None	Final	9/30/99
RD-5	NOAA PGS Interface Definition for IJPS Level 0 and Telecommand Data	None		10/4/00
RD-6	NOAA Ground Segment Level 0 and Telecommand Data Communication Architecture Options in the IJPS Period	None		March 01
RD-7	Software Requirements Specification for the Polar Acquisition and Control System	ISI-169-24	Rev A	Dec 90
RD-8	POES Ground Segment Upgrade Description for IJPS	NO-IJ/OSD-00-0005-R0UD0	Issue 1a	5/15/00
RD-11	POES Concept of Operations	NOAA-POES/OSO-2001-0001R0UD0	DCN 0	2/26/01
RD-12	Satellite to Ground Interface (NOAA-N&N')	LMAS IS 23033284		8/14/2000
RD-15	EPS Core Ground Segment Interface Requirements on NOAA Ground Segment	NOAA-POES-IJPS/OSD-2001-0002R0UD0	Issue 2.2	11/13/01
RD-16	NOAA Interface Requirements on EPS Core Ground Segment	NOAA-POES-IJPS/OSD-2001-0003R0UD0	Issue 2.2	11/13/01

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2.   CDAS and SOCC Upgrades

2.1   CDAS and SOCC Overview

The CDASs and the SOCC play important roles in the PGS. Together they provide the POES instrument and satellite command and control along with the reception of environmental data from the POES satellites. Much of the functionality of the CDASs and SOCC is implemented in common software and identical hardware that is present in FCDAS and WCDAS and the SOCC. The CDASs and SOCC might be considered separate elements in the PGS; but because they actually run a common system, it is best to consider the three to be one "super" element in the PGS. One development will provide the upgrades necessary for IJPS.

2.1.1 Current CDAS

A CDAS's current primary mission is to meet the command, telemetry, data acquisition and selected data routing requirements of the POES system. The CDASs contain the antennas, Radio Frequency (RF) and switching equipment that provide the space-to-ground and ground-to-space links with the POES satellites. This equipment is configured, controlled and monitored by processes executing in CDAS processing hardware. Interfaces with the POES satellites are described in AD-22, and RD-2, and are defined in RD-12.

Command loads are usually generated by the SOCC well in advance of a commanding session. During the satellite contact the CDAS does the final command processing and transmits commands to the POES satellite. Real-time commands can be generated either at the SOCC or at the CDAS.

A CDAS can receive, process and route POES High Resolution Picture Transmission (HRPT), Advanced Microwave Sounding Unit (AMSU) Information Processor (AIP), Television Infrared Observation Satellite (TIROS) Information Processor (TIP), Global Area Coverage (GAC), Local Area Coverage (LAC), Stored TIP (STIP) and Stored AIP (SAIP) data. During normal contacts only TIP, HRPT, GAC and LAC data are downlinked. Downlinked data is recorded at the CDAS. Real-time telemetry is retrieved from the downlinked TIP and from the HRPT data stream. TIP data is processed locally and forwarded real-time to the SOCC. HRPT data is normally forwarded real-time to Suitland for processing. GAC and LAC data stored on the POES satellites and received and recorded at the CDAS during the satellite contact is played back after the pass and sent on to the SOCC. If necessary any downlinked POES mission data can be recovered from the short-term CDAS archive.

The CDAS interfaces with the SOCC are through leased Satellite Communications (SATCOM) and Ground communication systems. AD-22, RD-4, RD-5, and RD-6 discuss this and future communication architectures.

FCDAS and WCDAS perform monitor and quality control functions. CDAS processes monitor the status of the CDAS, its hardware and communications links, and the quality of the acquired data.

Satellite contact/pass activities are scheduled by the SOCC and can be executed by the CDAS. Synchronized schedules are running simultaneously in the SOCC and CDAS during satellite contacts. This automated execution allows the CDAS to be operated from the SOCC. If necessary, the CDAS can execute the schedule without the SOCC or the CDAS can be operated manually.

2.1.2 Current SOCC

All PGS command, control and data acquisition activities are directed from the SOCC. Current SOCC responsibilities include:

a) scheduling, controlling and monitoring SOCC, CDAS and communication resources in support of the POES satellites;
b) command generation and formatting;
c) telemetry processing and satellite health and status monitoring;
d) trending;
e) telemetry archiving;
f) database management;
g) navigation;
h) test and training support; and
i) engineering management.

The SOCC schedules both the POES satellite activities and POES ground segment activities. Contact level scheduling identifies the satellite contacts that will be taken at FCDAS and WCDAS. CDAS resource conflicts are resolved on a priority basis in determining which satellites will be supported by which CDAS at what times. The SOCC determines the events that can take place during each satellite orbit. These events include data to be recorded on the satellite, when and what downlinks will occur, what uplinks will occur, as well as calibrations and other support and housekeeping activities. The SOCC then builds the stored command table (SCT) that is loaded into the satellite CPU during a commanding session (usually once a day). Satellite operations are directed by this SCT. The SOCC also creates a command level schedule to configure the ground segment equipment in accordance with satellite activities. By executing synchronized schedules, the SOCC remotely configures and controls CDAS equipment and software. The SOCC also has the ability to manually configure CDAS equipment and software. The SOCC monitors schedule execution and CDAS status.

The SOCC receives POES ephemeris files from the Control Environment Satellite Computer System (CEMSCS) twice a week. The SOCC generates spacecraft ground tracks, spacecraft/CDAS contacts, equator crossings, and Solar Backscatter Ultra-Violet Spectral Radiometer (SBUV) instrument events based on this predicted ephemeris.

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Satellite commands originate either from the automated SOCC schedule or manually from a local workstation. The commands are sent to the CDAS responsible for the satellite contact via a dedicated narrowband communication link. The CDAS is responsible for the final command processing and transmission to the satellite. Four levels of command verification are provided.

During a satellite pass, real-time telemetry is simultaneously received at the SOCC from the CDAS through two methods. Telemetry that was processed out of the TIP downlink at the CDAS comes via the dedicated narrowband communication link. Real-time telemetry is also embedded in the HRPT delivered to the SOCC via a SATCOM link. SOCC operators select which real-time telemetry source to process. Telemetry processing is also applied to back-orbit telemetry collected during satellite passes. Telemetry processing includes frame synchronization, decommutation, Engineering Unit (EU) conversion, limit checking, pseudo-telemetry generation, on-line history archiving, and trend processing and archiving. CDASs and SOCC telemetry processing capabilities are equivalent. During pre-launch and launch activities, telemetry can be received through the Goddard Space Flight Center (GSFC) or from the satellite factory. The Launch Control Room in the SOCC supports POES launch activities. During launch and early orbit, the SOCC uses Air Force Satellite Control Network (AFSCN) and Deep Space Network (DSN) resources for commanding and receiving telemetry from the satellite.

All of the acquired telemetry, real-time or back-orbit data is decommuted and stored in segment files. These files are further processed and stored in a history archive. This data may be used to generate analysis reports or may be played back as an input to the real-time processing software. Trending is performed on selected data parameters and then stored.

The SOCC manages and maintains operational databases. The telemetry database contains the information needed by the real-time telemetry process to convert the raw satellite telemetry counts into EUs. The command database contains a list of valid satellite commands, the format to transmit them in, and any pre-requisite states of the satellite prior to execution of the command. The display page database consists of a description of all of the operator display pages within the SOCC and CDAS system. The SOCC also provides configuration management of the POES Flight Code. The SOCC monitors status and performance and has the capability to generate reports on data quality and event histories.

The SOCC has the capability to train its operators. It includes a spacecraft simulator that supports test and training.

A capability exists to fail over from the SOCC to a CDAS during critical time periods when the SOCC cannot successfully perform its mission. The PGS CDASs have the capability to provide command transmissions to and data acquisitions from the spacecraft. During short-term outages, both PGS CDASs back up the SOCC. If SOCC operations are suspended for longer than 24 hours, the WCDAS becomes the operational SOCC. In long-term outages, SOCC personnel are relocated to perform additional functions not normally performed by the WCDAS staff.

Additional information on the current baseline for the CDAS and SOCC architecture and functionality can be found in RD-2, RD-7 and RD-11.

2.2   IJPS Overview

IJPS is the integrated combination of the NOAA POES System and the EUMETSAT Polar System. These two independent systems will be operated in a fully coordinated fashion with integrated data flows. In the IJPS era, NOAA will provide the afternoon satellite (NOAA N or NOAA N') and EUMETSAT will provide the morning satellite (Metop-1 or Metop-2). Both NOAA and EUMETSAT satellites will carry a core set of instruments (Advanced Very High Resolution Radiometer (AVHRR)/3, High Resolution Infrared Sounder (HIRS)/4, AMSU-A1/-A2, Data Collection System (DCS), Search and Rescue Instrument (SARSAT), Space Environment Monitor (SEM), and Microwave Humidity Sounder (MHS)) that will continue the data collections of earlier NOAA POES satellites. In addition to the core instruments NOAA N and N' will carry a SBUV/2 instrument and Metop-1 and 2 will carry Infrared Atmospheric Sounding Interferometer (IASI), Advanced Scatterometer (ASCAT), Global Navigation Satellite System Receiver for Atmospheric Sounding (GRAS), and Global Ozone Monitoring Experiment (GOME)-2 instruments. NOAA N will carry are earlier generation versions of the DCS and SARSAT instruments than those flown on NOAA N', Metop 1 and Metop 2.

Each IJPS ground segment system (PGS and EPS Ground Segment) will operate its own satellites and provide blind-orbit and cross-support functions to its partner's IJPS satellites. In blind-orbit and cross-support situations the partner's ground segment becomes an extension of the satellite's own ground segment for commanding, real-time telemetry retrieval and global data receipt. The EPS Core Ground Segment (CGS) will be the primary EPS interface with the PGS. All IJPS global satellite data acquired by each ground segment is made available to the other ground segment. Global data is Metop Global Data Stream (GDS) and POES GAC data. When GAC data is unavailable from a POES satellite, either SAIP or STIP data is exchanged. The satellite data exchange will occur through interfaces located at Suitland, Maryland, and Darmstadt, Germany. The PGS will deliver all acquired global data (POES and Metop) and Metop cross-support telemetry to the Suitland interface and will receive Metop cross-support commands there. In a similar fashion, the PGS will receive all EPS CGS acquired global data (POES and Metop) and cross-support IJPS POES telemetry at the Darmstadt interface and will deliver cross-support IJPS POES commands there. Performance requirements for the interfaces between the EPS CGS and the PGS can be found in RD-15 and RD-16.

For the two ground segments to operate in such a virtually integrated fashion much coordination and data exchange will be necessary. Joint processes are defined in AD-14.   A common voice-loop exchange will exist in both ground segments to support joint operations.

IJPS operations will start after the first Metop satellite has been successfully commissioned.

2.2.1 CDAS Upgrades

In general, current CDAS capabilities are expected to be adequate to support NOAA N and N'. However, NOAA N will carry the MHS instrument provided by EUMETSAT and the updated HIRS/4 instrument provided by NOAA. NOAA N' will carry MHS, HIRS/4 and two upgraded NOAA provided instruments (A-DCS and Search and Rescue Processor (SARP)-3). FCDAS

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and WCDAS must provide the capability to monitor the real-time telemetry for these new instruments, and generate and uplink commands for them.

Additional capabilities are required to support Metop satellites. Metop Space to Ground interfaces are defined in AD-16. The FCDAS must be capable of supporting the Metop satellite passes. Because of the location of the EPS CGS CDAS, the CGS has no actual blind Metop orbits. However, situations may arise when FCDAS support will be needed. The CGS will request FCDAS support when desired. The SOCC will receive the CGS requests and schedule the FCDAS resources.

During a scheduled FCDAS pass, Metop will downlink a hard-keyed Quadrature Phase Shift Keyed (QPSK) 70 Mbps GDS bit stream at X-Band for approximately 6 minutes of the CDAS acquisition window. Metop will also downlink a PM Modulated 4.096 kbps telemetry bit stream at S-Band for the complete duration of the CDAS acquisition window. If commanding support is requested, the FCDAS will uplink to Metop a Non Return to Zero-L-Phase Shift Keyed (NRZ-L-PSK) command bit stream at 2 kbps in S-band. The commands will be sent in throughput mode as received from the Communications Element (CE).

New FCDAS capabilities include:
- Autotracking of X-band signals during Metop passes
- Demodulation of the GDS data stream
- Bit synchronization of the GDS data stream
- Frame synchronization of the GDS data stream
- RF modulation for the Metop command uplink
- Demodulation of the Metop telemetry (TM) stream
- Bit Synchronization of the Metop TM stream
- Frame Synchronization of the Metop TM stream

Metop Global Data Stream data is in Consultative Committee for Space Data Systems (CCSDS) format. The FCDAS will de-randomize and Reed-Solomon decode the GDS data, determine the resulting quality and time stamp the data with Universal Time Code (UTC). The UTC time stamp and the quality flag are appended to the GDS data that is provided to the CE to be forwarded to Suitland. In real-time the Metop telemetry stream is UTC time stamped and sent on to Suitland.

The EPS Core Ground Segment will command the Metop satellite using the Suitland Interface and the FCDAS. The FCDAS will have the capability to create the NRZ-L-PSK command bit stream for uplink to the Metop satellite. The FCDAS will also acknowledge receipt of Metop commands and return the acknowledgment (via the CE) to the Suitland Interface in real time.

In addition to the IJPS agreements with EUMETSAT, NOAA desires to collect and process Metop HRPT (MHRPT) data during CDAS passes. Both PGS CDASs must be modified to acquire MHRPT data and extract a subset to be sent to the Ingest and Preprocessing System (IPS). MHRPT is a hard-keyed QPSK 3.5 Mbps bit stream at L-Band. The data is received for the complete duration of the CDAS acquisition window.

FCDAS and WCDAS must have the following capabilities:
- Autotracking L-band signals during Metop passes
- Control tracking of antennas during Metop passes
- Demodulation of the MHRPT data stream
- Bit synchronization of the MHRPT data stream
- Frame synchronization of the MHRPT data stream

MHRPT data is in CCSDS format. FCDAS and WCDAS will viterbi decode, de-randomize, and Reed-Solomon decode MHRPT data and filter the output to be sent to IPS. Selected Virtual Channel Data Units (VCDU) will be forwarded from the CDAS.

FCDAS and WCDAS will have, at a minimum, a rolling 7-day archive of the all of the global data it receives from IJPS POES satellites. FCDAS will maintain a rolling 7-day archive of the all of the global data it receives from Metop satellites.

The current PGS CDAS capability to configure, control, and monitor hardware and software processes must be extended to cover IJPS hardware and software.

RD-8 also discusses FCDAS and WCDAS upgrades for IJPS.

In IJPS, the WCDAS will serve as the Backup SOCC. As such, the WCDAS capabilities will include:
- Coordination with CGS for IJPS POES cross support
- POES commanding through Darmstadt
- Receiving blind POES TM from Darmstadt
- Receiving POES command echoes from Darmstadt
- Managing CE resources for IJPS operations

2.2.2 SOCC Upgrades

The SOCC responsibilities for the IJPS POES satellites are identical to the responsibilities it has for current POES satellites. Additional SOCC capabilities are required to support Metop satellites and to use EPS resources for IJPS POES satellites. IJPS POES satellite contacts through the IJPS PGS CDASs will be similar to POES operations today. However, some IJPS POES satellite contacts will be via an EPS CGS CDAS. Routinely three to four blind-orbit passes a day will be via the CGS. Other cross-support contacts can be coordinated with EUMETSAT when needed. Telemetry and mission data downlinked during CGS passes will be delivered to the Darmstadt interface and transported by the NOAA CE to Suitland. The SOCC can command through the Darmstadt interface and CGS during such satellite contacts. The SOCC must have the capability to exercise its command and control functions using both PGS and CGS resources.

As discussed in Section 2.2.1, IJPS POES satellites carry new instruments. The SOCC must provide the capability to process telemetry, monitor health and status, trend performance and

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state of health, archive telemetry, schedule instrument operations, and generate and format commands for these new instruments. SOCC displays, databases and procedures must support these instruments. The SOCC must also be capable of providing POES MHS telemetry to EUMETSAT.

In addition to current scheduling capabilities, the SOCC must schedule IJPS POES passes at CGS CDASs, MHRPT collections at POES CDASs, and when requested, Metop contacts at the FCDAS. Stored Command Tables for the IJPS POES satellites must reflect CGS CDAS contacts. PGS CDAS command level schedules must reflect the Metop and IJPS POES passes at that station. The SOCC works in close coordination with the CGS to plan and schedule. Data and voice links must be set up with the CGS as discussed in AD-14.

The SOCC monitor and control functions must be extended to include IJPS-unique PGS equipment, software, and communication resources. Reporting functions also must be expanded for IJPS.

The IJPS Agreement dictates that the IJPS PGS include a geographically separate backup SOCC to carry on IJPS operations in the absence of the SOCC. The backup SOCC will be located at the WCDAS.

RD-8 also discusses SOCC upgrades for IJPS.

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3.   CDAS / SOCC Upgrade Requirements

A single development will provide the upgrades to the PGS CDASs (Fairbanks and Wallops) and the SOCC needed to support IJPS. This development will be referred to as the CDAS/SOCC Upgrade (CSU). Many requirements are equally applicable to upgrades being made to both the CDASs and to the SOCC. As such, they state capabilities and properties that the CSU is required to have. There are also requirements unique to the upgraded SOCC and others that are unique to the upgraded CDASs. Some CDAS-unique requirements are only applicable to the FCDAS and some are only applicable to the WCDAS. Other CDAS-unique requirements apply to both PGS CDASs. In IJPS, the PGS will contain both an upgraded SOCC and a backup SOCC. The Backup SOCC will provide much of the functionality of the SOCC.

Requirements are identified with unique Requirements IDs followed by paragraphs of text. Also associated with each requirement is a verification method. The format is as follows:

Requirements ID	Verification Method
Text Paragraph	

- **Requirement ID** – The requirement header is in the form "CSU-<Context>-<a.b.c.d.>-<number>"
    - **CSU** stands for CDAS/SOCC Upgrade
    - <**Context**> corresponds to one of the ground segment components or to a common category as defined in Table 3-1
    - <**a.b.c.d.**> corresponds to the subsection in which the requirement is contained
    - <**number**> is a sequential number
- **Verification Method** lists the method(s) selected for verification of the requirement. The list of verification methods is given in Table 3-2
- **Text Paragraph** is the requirement statement

Table 3-1. Requirement Context

Context Field	*Definition*
CR	Common Requirements applicable to both PGS CDASs and the SOCC
CDA	Command and Data Acquisition Station unique
SOC	Satellite Operations and Control Center unique

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Table 3-2. Verification Methods

Verification Field	Definition
Test	Test is the exercise of hardware, software, or operations to measure quantitatively specified requirements.
Demo	Demonstration is the determination of properties and performance involving proof-by-doing.
Analysis	Analysis is an engineering assessment and/or mathematical process that may include computer modeling and/or simulation to determine compliance with specification requirements.
Inspection	Inspection is the examination or measurement of product characteristics or the review of design, production or test documentation to determine compliance with specified requirements.

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3.1   CDAS / SOCC Upgrade Common Requirements

Requirements applicable to blind-orbit cross support also cover the specific cases of contingency support for satellite operations (Global data, TM, Telecommand (TC)) upon request for such operations.

CSU-CR-3.1-0010   Demo, Analysis
The CSU shall not impact the ability of the PGS to meet existing POES System requirements [RDN-4 Section 3.2.2, PGSL-3.2.2.1 -010].

CSU-CR-3.1-0020   Demo, Analysis
The CSU shall provide, at a minimum, identical functionality for IJPS POES satellites as that provided for POES satellites by the POES CDASs and SOCC [RDN-4 Section 3.2.2, PGSL-3.2.2.1-010].

CSU-CR-3.1-0030   Analysis, Test
The CSU shall be compatible with the EUMETSAT Ground Segment regarding required data exchange   [PGSL-3.2.2-3-020/021/025/030/040/050/060/070/080,   PCDAS-3.3.1.1-040/080/090/100/120].

CSU-CR-3.1-0040   Demo, Analysis
The CSU shall support continuous, 24-hours-a-day, seven-days-a-week operations [PGSL-3.2.2.1-010].

CSU-CR-3.1-0050   Demo, Analysis
The CSU shall provide tools necessary for a trained operator to accomplish allocated tasks within allocated time and system performance requirements [PSYS-3.1.4-020, PGSL-3.2.2.1-010].

CSU-CR-3.1-0060   Analysis
The CSU shall support IJPS POES split mission operations [PCDAS-3.3.1.1-110, PSOC-3.3.2.1-020/040/130/140/150/170/180/190/205].

CSU-CR-3.1-0070   Demo, Analysis
The CSU shall support IJPS operations, backlog processing, reprocessing, validation processing, and system testing (IJPS and PGS) [PGSL-3.2.2.2-010/030, PCDAS-3.3.1.2-020/030/040, RDN-4 Section 4].

3.1.1 Monitor and Control

CSU-CR-3.1.1-0010   Analysis
CSU shall not degrade the current SOCC and CDAS system capabilities to protect data, software and processes against destruction, denial of service, unauthorized modification and disclosure to unauthorized individuals [PGSL-3.2.2.1-010].

CSU-CR-3.1.1-0020   Demo
CSU system modifications relating to control, monitoring, and reporting shall be capable of being integrated into the existing CDAS/SOCC POES baseline system [PGSL-3.2.2.1-010].

CSU-CR-3.1.1-0030   Demo
The CSU shall provide the capability for operators to monitor new equipment configurations used in support of IJPS satellites [PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030, PSOC-3.3.2.1-010].

CSU-CR-3.1.1-0040   Demo
The CSU shall provide the capability for operators to monitor schedule execution in support of Metop satellites and new IJPS POES satellite activities [PGSL-3.2.2.1-010, PCDAS-3.3.1.1-020/025/050,   PCDAS-3.3.1.2-020,   PSOC-3.3.2.1-010/020/030/040/050/060/070/071/080/091/100/110/130/140/150/160/170/190/210].

CSU-CR-3.1.1-0050   Demo
The CSU shall provide the capability to monitor operational status of hardware, equipment, software, internal networks and external networks, used to support IJPS satellites [PGSL-3.2.2.4-020,   PCDAS-3.3.1.2-020,   PCDAS-3.3.1.4-030/040/050/060/070/080/090,   PSOC-3.3.2.1-010, PSOC-3.3.2.4-020/030/031/040/050/051/060].

CSU-CR-3.1.1-0060   Demo
The CSU shall provide the capability to detect and notify operators of frame data errors, frame losses, and sync losses in a) Metop satellite telemetry, b) Metop GDS data streams, and c) MHRPT data streams received at the PGS CDASs [PGSL-3.2.2.4-020/060/070, PCDAS-3.3.1.2-020, PCDAS-3.3.1.4-030/070/080].

CSU-CR-3.1.1-0070   Demo
The CSU shall provide the capability to notify operators of an out-of-nominal condition for hardware and software resources delivered by the CSU development [PGSL-3.2.2.4-020, PCDAS-3.3.1.2-020, PCDAS-3.3.1.4-030/040, PSOC-3.3.2.1-010].

CSU-CR-3.1.1-0080   Demo
The CSU shall provide the capability to point ground antennas at and to track Metop satellites to support commanding and downlink data collection [PCDAS-3.3.1.1-020/025/050, PCDAS-3.3.1.2-020, PSOC-3.3.2.1-050/060/080].

3.1.2 Commanding and Telemetry Processing

CSU-CR-3.1.2-0010   Demo
Metop TC shall pass through the CSU in a throughput mode from the Suitland Interface [PGSL-3.2.2.2-040, PCDAS-3.3.1.1-040/050].

CSU-CR-3.1.2-020   Demo
Metop telemetry shall pass through the CSU in a throughput mode to the Suitland Interface [PGSL-3.2.2.2-040, PCDAS-3.3.1.1-040/050].

CSU-CR-3.1.2-030   Demo
FCDAS, WCDAS and the SOCC shall provide the capability to monitor the health and status of IJPS POES MHS instruments in real time [PSOC-3.3.2.1-025/180/190].

CSU-CR-3.1.2-040   Demo
FCDAS, WCDAS and the SOCC shall be able to ingest, decommutate, archive and trend IJPS POES MHS telemetry [PSOC-3.3.2.1-025/180/190].

3.1.3 Data Storage

CSU-CR-3.1.3-0010   Demo
The CSU shall provide the capability to associate attributes with each piece of Metop recorded and archived data to include, at a minimum: a) date and time, b) data identifier, c) satellite ID, and d) orbit number [PGSL-3.2.2.1-010, PCDAS-3.3.1.2-040, PCDAS-3.3.1.4-020].

CSU-CR-3.1.3-0020   Demo
The CSU shall provide the capability to retrieve recorded and archived Metop data by data identifier and the following sort criteria, at a minimum: a) date and time, b) satellite ID, and c) orbit number [PGSL-3.2.2.1-010, PCDAS-3.3.1.2-030/040.].

3.1.4 Anomalies and Contingency

CSU-CR-3.1.4-0010   Test
The CSU shall provide the capability to recognize and continue operations in the event that IJPS POES data received from the Darmstadt Interface is corrupt (e.g. corrupted at source), is duplicated (e.g. downlinked twice), is out of time sequence, is incomplete, or is missing (e.g. between passes) [PGSL-3.2.2.1-010, PCDAS-3.3.1.1-020/025/050/080, PSOC-3.3.2.1-010/030/040/050/060/070/080/090/100/110/130/150/160/170/190/210].

CSU-CR-3.1.4-0020   Demo
The CSU shall provide to operators the capability to direct the failover to redundant CSU equipment and interfaces in the event of failure of on-line equipment or interfaces [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-020, PCDAS-3.3.1.4-030/040/070/080/090, PSOC-3.3.2.1-020/030/040/050/060/070/071/080/091/100/110/140/150/160/170/190/210, PSOC-3.3.2.4-040/050/051/060].

CSU-CR-3.1.4-0030   Demo, Analysis
The CSU shall provide capabilities that aid in detecting, diagnosing and resolving anomalies in the IJPS POES MHS instruments [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010].

CSU-CR-3.1.4-0040   Demo, Analysis
The CSU shall provide capabilities that aid in detecting, diagnosing and resolving anomalies in CSU ground resources [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030].

CSU-CR-3.1.4-0050   Demo, Analysis
The CSU shall provide support to the investigation and respond to in-orbit anomalies and emergency situations related to the NOAA-provided instruments on Metop satellites [PCDAS-3.3.1.1-080, PSOC-3.3.2.1-50/60/120/200].

3.1.5 Operational Requirements

CSU-CR-3.1.5-0010   Demo, Analysis
The CSU shall be capable of providing support to Metop satellite operations upon the successful completion of the System Commissioning Review (SCR) for that Metop satellite [PCDAS-3.3.1.2-010, PSOC-3.3.2.2-010].

CSU-CR-3.1.5-0020   Demo, Analysis
The CSU shall be capable of supporting IJPS POES satellite operations upon the successful completion of the On-orbit Verification Review for that POES satellite [PCDAS-3.3.1.2-010, PSOC-3.3.2.2-010].

CSU-CR-3.1.5-0030   Demo, Analysis
The CSU shall provide the capability to support Early Orbit testing of IJPS POES Satellites simultaneously with normal IJPS operations [RDN-4 Section 3.2.2, PGSL-3.2.2.1-010].

CSU-CR-3.1.5-0040   Demo, Analysis
The CSU shall provide the capability to support IJPS POES satellite pre-launch activities simultaneously with normal IJPS operations [RDN-4 Section 3.2.2, PGSL-3.2.2.1-010].

CSU-CR-3.1.5-0050   Demo, Analysis
The CSU shall provide the capability to support IJPS POES satellite commissioning activities simultaneously with normal IJPS operations [RDN-4 Section 3.2.2, PGSL-3.2.2.1-010].

CSU-CR-3.1.5-0060   Demo, Analysis
For instruments provided by NOAA to Metop 1 and 2, the CSU shall provide the ability to support Metop post launch checkout, commissioning and operations using the Operational Support Entities in accordance with the NOAA Ground Segment to EPS Ground Segment Interface Control Document (ICD) [AD-15] [PIP-6.2, Item 3; PIP-5.2.2].

CSU-CR-3.1.5-0070   Demo, Analysis
The CSU shall provide the capability to complete the transfer of IJPS Satellite Global data (GAC/STIP/SAIP, GDS) for orbit N, via the CE, to the Suitland Interface prior to the start of pre-pass activities for Orbit N+1 [PGSL-3.2.2.1-190, PCDAS-3.3.1.1-120, PSOC-3.3.2.1-210].

3.1.6 Test and Verification and Validation (V&V) Support

CSU-CR-3.1.6-0010   Analysis
All necessary test points shall be provided within the CSU that are required to perform in a repeatable fashion the integration, verification and acceptance of the CSU [PGSL-3.2.2.1-010, PGSL-3.2.2.2-010/030, PGSL-3.2.2.3-020/050, RDN-4 Section 4].

CSU-CR-3.1.6-0020   Analysis
All necessary data injection points shall be provided within the CSU to perform in a repeatable fashion the integration, verification and acceptance of the CSU and to support space vehicle testing [PGSL-3.2.2.1-010, PGSL-3.2.2.2-010/030, PGSL-3.2.2.3-020/050, RDN-4 Section 4].

3.1.7 External Interfaces

CSU-CR-3.1.7-0010   Test, Analysis
The CSU shall deliver data, in formats in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], to the Suitland Interface [PGSL-3.2.2.3-020/030].

CSU-CR-3.1.7-0020   Demo, Analysis
The CSU (in conjunction with the CE) shall make NOAA IJPS POES Global data available to the Suitland Interface in a manner that allows such data to be transmitted in pipeline mode to EUMETSAT [PGSL-3.2.2.3-020/030].

CSU-CR-3.1.7-0030   Demo
The CSU (in conjunction with the CE) shall make Metop GDS data available to the Suitland Interface in pipeline mode [PGSL-3.2.2.3-020/030].

CSU-CR-3.1.7-0040   Demo
If GAC data is unavailable from an IJPS POES satellite, the CSU shall provide CDAS acquired SAIP or STIP at the Suitland interface [PGSL-3.2.2.1-070/150/160, PCDAS-3.3.1.4-090,PSOC-3.3.2.1-160].

3.1.8 Maintainability

CSU-CR-3.1.8-0010   Analysis
The CSU upgrades shall be maintainable over the IJPS lifetime [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.8-0020   Analysis, Inspection

It shall be possible to perform failure investigation (e.g., H/W, S/W and communication investigations) in parallel with, but without detrimental impact on, normal operations [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.8-0030   Analysis, Inspection

It shall be possible to perform hardware and software maintenance activities on the CSU in parallel with, but without detrimental impact on, normal operations [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.8-0040   Analysis, Inspection

It shall be possible to release a new version of any configuration controlled CSU item without detrimental impact on the availability of the PGS [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.8-0050   Demo, Analysis,
                                                     Inspection

CSU hardware shall be developed and selected such that maintenance can be performed on site [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.8-0060   Demo

The CSU shall provide on-line help to operators for any new or modified software [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

3.1.9 Reliability, Dependability and Availability

CSU-CR-3.1.9-0010   Demo, Analysis,
                                                     Inspection

The CSU shall provide diagnostics and system configuration programs for fault detection (failure and degradation), fault isolation, indication alarms and control necessary to meet reliability and availability requirements [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.9-0020   Demo, Analysis

Automated and/or manual diagnostics to isolate faults to the Line Replaceable Unit (LRU) shall be provided for all CSU installed equipment [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.9-0030   Analysis

The downtime of the CSU IJPS GAC acquisition chain from a CDAS antenna to the Suitland Interface shall not exceed 360 minutes [PGSL-3.2.2.4-080].

CSU-CR-3.1.9-0040   Analysis

The downtime of the CSU Metop GDS acquisition chain from the FCDAS antenna to the Suitland Interface shall not exceed 360 minutes [PGSL-3.2.2.4-080].

CSU-CR-3.1.9-0050   Analysis

The downtime of the CSU Metop TM acquisition chain from the FCDAS antenna to the Suitland Interface shall not exceed 100 minutes [PGSL-3.2.2.4-070].

CSU-CR-3.1.9-0060   Analysis

The downtime of the CSU Metop TC transmission chain from the Suitland Interface through the FCDAS antenna shall not exceed 100 minutes [PGSL-3.2.2.4-090].

CSU-CR-3.1.9-0070   Test, Analysis

The CSU shall have an overall system availability of 99.6% [PGSL-3.2.2.4-020].

CSU-CR-3.1.9-0080   Analysis

The downtime of the CSU MHRPT acquisition chain from a CDAS antenna to the IPS shall not exceed 360 minutes [PGSL-3.2.2.4-110].

3.1.10 Design

CSU-CR-3.1.10-0010   Analysis

CSU-delivered hardware shall be capable of interfacing with existing PGS hardware [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0020   Analysis

CSU hardware equipment, operating system and Commercial-off-the-shelf (COTS) software shall be selected from product families: 1) whose availability is projected to be ensured over the IJPS PGS lifetime, and 2) that ensure upward compatibility between the successive versions of a given product [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0030   Analysis

The CSU hardware shall be developed or selected to be supportable or upgradeable over the IJPS PGS design life [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0040   Analysis

The CSU software shall be developed or selected to be supportable or upgradeable over the IJPS PGS design life [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0050   Analysis

Each of the CSU sub-elements shall offer the necessary level of modularity to allow system functional or performance evolutions with limited impact on the system design [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0060   Analysis

The CSU hardware design shall support the update of operational hardware without disruptions to mission functions that exceed IJPS reliability, availability and dependability requirements [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0070   Analysis, Inspection

Hardware delivered by the CSU development shall not increase CDAS and SOCC facility thermal and humidity control requirements [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0080   Analysis, Test

New CSU equipment shall be sized with 50% computer reserve capacity for input/output and processor computing throughput during any period of peak load conditions [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0090   Analysis

New CSU equipment shall provide sufficient disk storage to meet CSU IJPS requirements with 50% reserve [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

CSU-CR-3.1.10-0100   Analysis, Test

The CSU LANs shall provide sufficient bandwidth to meet CSU IJPS requirements with 50% reserve [PGSL-3.2.2.4-020, PCDAS-3.3.1.4-030/040].

3.1.11 Performance

CSU-CR-3.1.11-0010   Test

The CSU shall deliver the first IJPS GAC data via the CE to the Suitland Interface no later than 120 seconds after loss of signal. The CSU shall be allocated 119 (To be confirmed (TBC)) seconds of the 120 seconds [PGSL-3.2.2.4-030].

CSU-CR-3.1.11-0020   Test

The CSU shall complete delivery of IJPS GAC data to the Suitland Interface no later than 100 minutes after completion of the GAC dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds to complete the delivery of the last data item [PGSL-3.2.2.4-030].

CSU-CR-3.1.11-0030   Test

During split mission operation, the CSU shall provide the capability to process and deliver to the Suitland Interface any of the following, with the same performance as during nominal operations:
    a) 2 orbits of GAC
    b) 1 orbit GAC and 1 orbit of SAIP
    c) 1 orbit GAC and 1 orbit of STIP
    d) 2 orbits of SAIP
    e) 1 orbit of SAIP and 1 orbit of STIP
    f) 2 orbits of STIP
[PCDAS-3.3.1.1-110, PSOC-3.3.2.1-170]

CSU-CR-3.1.11-0040   Test

The CSU shall deliver the first Metop GDS data via the CE to the Suitland Interface no later than 120 seconds after completion of the GDS dump. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds [PGSL-3.2.2.4-040].

CSU-CR-3.1.11-0050   Test

The CSU shall complete delivery of Metop GDS data to the Suitland Interface no later than 100 minutes after completion of the GDS dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds to complete the delivery of the last data item [PGSL-3.2.2.4-040].

CSU-CR-3.1.11-0060   Test

The delay between the completion of the Metop TM frame acquisition at the FCDAS and its delivery via the CE to the Suitland Interface shall be less than 1 second. The CSU shall be allocated .75 seconds (TBC) of the 1 second [PGSL-3.2.2.4-070].

CSU-CR-3.1.11-0070   Test

Metop TC shall be uplinked to the Metop satellite within 1 second of receipt at the Suitland Interface. The CSU shall be allocated .75 seconds (TBC) of the 1 second [PGSL-3.2.2.2-040, PSOC-3.3.2.4-070].

CSU-CR-3.1.11-0080   Test, Analysis

The CSU shall complete delivery to the IPS via the CE of filtered MHRPT VCDUs within 30 minutes post-pass. [PGSL-3.2.2.4-110].

CSU-CR-3.1.11-0090   Test, Analysis

The CSU shall ensure that 98.4 % (measured over any 30-day period) of the filtered MHRPT VCDUs are delivered via the CE to the IPS within timeliness requirements [PGSL-3.2.2.4-110].

CSU-CR-3.1.11-0100   Test, Analysis

CSU performance requirements (CSU-CR-3.1.11-0010, CSU-CR-3.1.11-0020, CSU-CR-3.1.11-0030) shall be met when SAIP or STIP data is provided to the Suitland interface instead of GAC data [PGSL-3.2.2.1-070].

CSU-CR-3.1.11-0110   Analysis

The CSU shall provide the capability to exercise cross support functions for one operational Metop satellite at a time [PGSL-3.2.2.1-120, PCDAS-3.3.1.1-080, PSOC-3.3.2.1-120].
Note: Requests for additional support will be accommodated within these intrinsic capabilities.

3.2   Upgraded CDAS-Unique Requirements

CSU-CDA-3.2-0010   Demo, Analysis
FCDAS and WCDAS shall provide the capability to carry out all necessary pre-pass, pass and post-pass CDAS activities for Metop [PGSL-3.2.2.1-010, RDN-4 Section 3.3.1, PCDAS-3.3.1.2-010]

3.2.1   Monitor and Control

CSU-CDA-3.2.1-0010   Demo
FCDAS and WCDAS shall provide the capability to locally configure and control IJPS CDAS hardware and software [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0020   Demo
Local control of the new CSU hardware and software shall be through a) local automated execution of the schedule, and/or b) manual commands [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0030   Demo
FCDAS and WCDAS shall provide the capability to override automated sequences [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0040   Demo
FCDAS and WCDAS shall provide the capability to configure and control local CDAS antennas for IJPS support [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0050   Demo
FCDAS and WCDAS shall provide the capability to configure and control local IJPS RF processing equipment for Metop support [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0060   Demo
FCDAS and WCDAS shall provide the ability to reconfigure CSU hardware during IJPS satellite contacts [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0070   Demo, Analysis
FCDAS and WCDAS shall provide the capability to locally monitor IJPS hardware and software resources [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0080   Demo
FCDAS and WCDAS shall provide the capability to monitor CDAS operations in support of IJPS [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

CSU-CDA-3.2.1-0090   Demo, Analysis

FCDAS and WCDAS shall provide the capability to monitor the data quality of downlink acquisitions from Metop satellites [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.2-010, PCDAS-3.3.1.4-030/040].

3.2.2 Data Acquisition

CSU-CDA-3.2.2-0010   Demo

FCDAS and WCDAS shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support downlink data collection [PCDAS-3.3.1.1-020/030, PCDAS-3.3.1.3-010, PCDAS-3.3.1.4-030].

CSU-CDA-3.2.2-0020   Demo, Analysis

The FCDAS shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support commanding [PCDAS-3.3.1.1-050, PCDAS-3.3.1.3-010, PCDAS-3.3.1.4-040].

CSU-CDA-3.2.2-0030   Demo

The FCDAS shall provide the capability to auto-track Metop satellite S-band, L-band and X-band downlinks [PCDAS-3.3.1.1-020/025/030, PCDAS-3.3.1.3-010, PCDAS-3.3.1.4-030].

CSU-CDA-3.2.2-0040   Demo

The FCDAS shall provide the capability to program-track during Metop satellite S-band, L-band and X-band downlinks [PCDAS-3.3.1.1-020/025, PCDAS-3.3.1.3-010, PCDAS-3.3.1.4-030].

CSU-CDA-3.2.2-0050   Demo

The WCDAS shall provide the capability to auto-track Metop satellite L-band downlinks [PCDAS-3.3.1.1-025].

CSU-CDA-3.2.2-0060   Demo

The WCDAS shall provide the capability to program-track during Metop satellite L-band downlinks [PCDAS-3.3.1.1-025].

CSU-CDA-3.2.2-0070   Demo

The FCDAS shall provide the capability to acquire Metop GDS X-band data in accordance with the Metop Space to Ground Interface specification [AD-16] [PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0080   Test

FCDAS and WCDAS shall provide the capability to acquire MHRPT L-band data in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0090   Test

The FCDAS shall provide the capability to acquire Metop TM S-band data in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0100   Test
The FCDAS shall provide bit synchronization for Metop downlink streams in accordance with
the Metop Space to Ground Interface Specification [AD-16] [PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0110   Test
The FCDAS shall provide demodulation for Metop downlink data streams in accordance with
the Metop Space to Ground Interface Specification [AD-16] [PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0120   Test
The WCDAS shall provide a) bit synchronization, and b) demodulation for MHRPT downlink
data streams, in accordance with the Metop Space to Ground Interface Specification [AD-16]
[PGSL-3.2.2.4-110, PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0130   Demo
The FCDAS shall perform RF processing and data routing of Metop downlinked data [PGSL-
3.2.2.4-110, PCDAS-3.3.1.1-020/025/030, PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0140   Demo
FCDAS and WCDAS shall perform RF processing and data routing of MHRPT data [PGSL-
3.2.2.4-110, PCDAS-3.3.1.1-025/030, PCDAS-3.3.1.3-010].

CSU-CDA-3.2.2-0150   Demo
The FCDAS shall provide the capability to inject test data at various points within each Metop
S - band, L-band, and X-band acquisition chain [PCDAS-3.3.1.4-030, RDN-4 Section 4].

CSU-CDA-3.2.2-0160   Demo
The WCDAS shall provide the capability to inject test data at various points within each Metop
L-band acquisition chain [PCDAS-3.3.1.4-030, RDN-4 Section 4].

3.2.3 Data Processing

CSU-CDA-3.2.3-0010   Demo
The FCDAS shall provide the capability to a) frame synchronize, b) de-randomize, c) Reed-
Solomon decode, d) VCDU error correct, and e) remove fill data from Metop GDS data
[PCDAS-3.3.1.1-060, PCDAS-3.3.1.4-080].

CSU-CDA-3.2.3-0020   Demo
The FCDAS shall provide the capability to append a quality flag (i.e. GOOD/BAD) to the Metop
GDS data, based on the Reed-Solomon information, in accordance with the NOAA Ground
Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.1-060, PCDAS-3.3.1.4-080].

CSU-CDA-3.2.3-0030   Demo
The FCDAS shall provide the capability to append a UTC time stamp to the Metop GDS data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.1-060, PCDAS-3.3.1.4-080].

CSU-CDA-3.2.3-0040   Test
The FCDAS shall provide the capability to UTC time stamp Metop TM data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.1-070, PCDAS-3.3.1.4-070].

CSU-CDA-3.2.3-0050   Demo
FCDAS and WCDAS shall provide the capability to a) viterbi decode, b) frame synchronize, c) de-radomize, and d) Reed-Solomon decode Metop HRPT data [PCDAS-3.3.1.1-030].

CSU-CDA-3.2.3-0060   Demo
FCDAS and WCDAS shall provide the capability to extract selected VCDUs from the MHRPT data stream [PCDAS-3.3.1.1-030].

CSU-CDA-3.2.3-0070   Demo
FCDAS and WCDAS shall provide the capability to append quality flags to MHRPT VCDUs to be sent to the IPS [PCDAS-3.3.1.1-030]. (To be determined (TBD))

CSU-CDA-3.2.3-0080   Demo
The FCDAS shall provide the capability to extract selected VCDUs (with appended time stamp and quality flag) from the Metop GDS data stream [NOAA requirement].

3.2.4 Commanding

CSU-CDA-3.2.4-0010   Test
The FCDAS shall provide the capability to encode and transmit Telecommands to Metop satellites in accordance with the Metop Space to Ground Interface specification [AD-16] [PCDAS-3.3.1.1-050].

CSU-CDA-3.2.4-0020   Demo
The FCDAS shall immediately uplink Metop Telecommands without alteration [PCDAS-3.3.1.1-050].

CSU-CDA-3.2.4-0030   Demo
The FCDAS shall provide the capability to inject test data into the Metop S-band commanding chain [PCDAS-3.3.1.4-040, RDN-4 Section 4].

CSU-CDA-3.2.4-0040   Test
The FCDAS shall provide the capability to generate Metop telecommand echoes in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.1-090].

3.2.5 Archiving and Data Storage

CSU-CDA-3.2.5-0010   Demo, Test, Analysis
FCDAS and WCDAS shall utilize existing capabilities to provide a seven-day rolling archive of IJPS POES global data acquired by that CDAS [PCDAS-3.3.1.4-020].

CSU-CDA-3.2.5-0020   Demo
The FCDAS shall provide the capability to store at least 7 days of Metop GDS data for later playback [PCDAS-3.3.1.1-140, PCDAS-3.3.1.4-020].

CSU-CDA-3.2.5-0030   Demo
The FCDAS shall provide the capability to store and retrieve Metop real-time TM [PGSL-3.2.2.2-010/030]. (TBD)

CSU-CDA-3.2.5-0040   Demo
FCDAS and WCDAS shall provide the capability to store Metop HRPT data for later processing and playback [PGSL-3.2.2.4-110].

CSU-CDA-3.2.5-0050   Demo
The FCDAS shall provide the capability to retrieve and playback Metop GDS data [PCDAS-3.3.1.1-140].

CSU-CDA-3.2.5-0060   Demo
FCDAS and WCDAS shall provide the ability to retrieve, playback and process Metop HRPT data [PGSL-3.2.2.4-110, PCDAS-3.3.1.1-030].

CSU-CDA-3.2.5-0070   Test, Analysis
FCDAS and WCDAS shall provide the capability to retrieve all or selected subsets of the IJPS satellite data archived by that CDAS [PCDAS-3.3.1.1-100, PCDAS-3.3.1.2-030/040].

CSU-CDA-3.2.5-0080   Demo
The FCDAS shall provide the capability to generate GDS backlog tapes, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.2-040].

3.2.6 External Interfaces

CSU-CDA-3.2.6-0010   Demo, Analysis
FCDAS and WCDAS shall provide extracted MHRPT data to the CE in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21] [PCDAS-3.3.1.1-030].

CSU-CDA-3.2.6-0020   Demo, Analysis
The FCDAS shall provide extracted Metop GDS data to the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.3-030/040].

CSU-CDA-3.2.6-0030   Demo, Analysis
The FCDAS shall provide Metop TM data to the CE, in accordance with the NOAA Ground
Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.3-030/040, PCDAS-3.3.1.4-070].

CSU-CDA-3.2.6-0040   Demo, Analysis
The FCDAS shall provide the capability to forward to the CE time stamped Metop TM in real
time [PCDAS-3.3.1.1-070, PCDAS-3.3.1.4-070].

CSU-CDA-3.2.6-0050   Demo, Analysis
The FCDAS shall provide Metop telecommand echoes to the CE, in accordance with the NOAA
Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.1-090].

CSU-CDA-3.2.6-0060   Demo, Analysis
The FCDAS shall receive Metop Telecommand data from the CE, in accordance with the NOAA
Ground Segment to EPS Ground Segment ICD [AD-15] [PCDAS-3.3.1.1-090].

CSU-CDA-3.2.6-0070   Demo
The FCDAS shall provide the ability to support the restart of the Metop GDS transmission to the
Suitland Interface, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD
[AD-15] [PGSL-3.2.2.4-060, PCDAS-3.3.1.4-080].

CSU-CDA-3.2.6-0080   Demo, Analysis
FCDAS and WCDAS shall interface with other PGS elements via the CE, in accordance with the
NOAA IJPS System Requirements for Communications Services [AD-22] [PCDAS-3.3.1.3-
030].

3.2.7 Performance

CSU-CDA-3.2.7-0010   Test
The FCDAS shall provide the ability to simultaneously support data acquisition and downlink
processing for one IJPS POES satellite and one Metop satellite [PGSL-3.2.2.1-010, PCDAS-
3.3.1.1-020/040/050/080/090, PCDAS-3.3.1.3-010].

CSU-CDA-3.2.7-0020   Test
The FCDAS shall provide the capability to simultaneously support data routing for one IJPS
POES satellite and one Metop satellite [PGSL-3.2.2.1-010, PCDAS-3.3.1.1-040/050/080/090/
110/120/130/140, PCDAS-3.3.1.3-040].

CSU-CDA-3.2.7-0030   Test
The FCDAS shall provide the capability to simultaneously support commanding for one IJPS
POES satellite and one Metop satellite [PGSL-3.2.2.1-010, PCDAS-3.3.1.1-040/050/080/090].

CSU-CDA-3.2.7-0040   Test

The WCDAS shall provide the capability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and for one Metop satellite (L-band only) [PGSL-3.2.2.1-010, PCDAS-3.3.1.3-010].

CSU-CDA-3.2.7-0050   Test

The WCDAS shall provide the capability to simultaneously support data routing for one IJPS POES satellite and MHRPT data routing and processing for one Metop satellite [PGSL-3.2.2.1-010, PCDAS-3.3.1.1-030].

CSU-CDA-3.2.7-0060   Test, Analysis

The FCDAS shall successfully transmit 99.8% of the Telecommand received from the CE to Metop satellites over any 30-day period [PCDAS-3.3.1.1-040].

CSU-CDA-3.2.7-0070   Test

FCDAS shall provide the capability to generate backlog tapes containing requested archived Metop GDS data within TBD of receiving the request [PCDAS-3.3.1.2-030/040].

CSU-CDA-3.2.7-0080   Test

The FCDAS shall time-tag Metop TM data with an accuracy of better than 50 microseconds (TBC) of UTC [PCDAS-3.3.1.1-070, PCDAS-3.3.1.4-070].

CSU-CDA-3.2.7-0090   Test

The FCDAS shall time-tag Metop GDS data with an accuracy of better than 100 microseconds (TBC) of UTC [PCDAS-3.3.1.1-060, PCDAS-3.3.1.4-080].

CSU-CDA-3.2.7-0100   Test, Analysis

FCDAS and WCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the IJPS POES GAC acquired by that CDAS to the CE [PGSL-3.2.2.4-050, PCDAS-3.3.1.4-090].

CSU-CDA-3.2.7-0110   Test, Analysis

CDAS performance requirement CSU-CDA-3.2.7-0100 shall be met when SAIP or STIP data is provided to the CE instead of GAC data [PGSL-3.2.2.4-050, PCDAS-3.3.1.4-090].

CSU-CDA-3.2.7-0120   Test, Analysis

The FCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop TM acquired by that CDAS to the CE [PGSL-3.2.2.4-070, PCDAS-3.3.1.4-070].

CSU-CDA-3.2.7-0130   Test, Analysis

The FCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop GDS acquired by that CDAS to the CE [PGSL-3.2.2.4-060, PCDAS-3.3.1.4-080].

CSU-CDA-3.2.7-0140   Test, Analysis

FCDAS and WCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop MHRPT VCDUs extracted by that CDAS to the CE [PGSL-3.2.2.4-110].

CSU-CDA-3.2.7-0150   Test, Analysis

FCDAS and WCDAS shall complete data processing for selected MHRPT VCDUs and delivery to the CE within TBD of the completion of the acquisition of the frame containing that data [PGSL-3.2.2.4-110].

CSU-CDA-3.2.7-0160   Test, Analysis

The SOCC shall deliver MHRPT data to IPS within TBD of receipt. [NOAA requirement]

CSU-CDA-3.2.7-0170   Test, Analysis

TBD% of the IJPS global data sent to archive at a CDAS shall be retrievable [PCDAS-3.3.1.2-030/040].

3.3   Upgraded SOCC-Unique Requirements

CSU-SOC-3.3-0010   Demo
The SOCC shall support the coordination with EUMETSAT necessary to ensure the day-to-day operation of each party's respective satellites and ground segment including contingency-support and blind orbit support tasks [PGSL-3.2.2.1-010, PSOC-3.3.2.1-010, PSOC-3.3.2.2-040].

CSU-SOC-3.3-0020   Demo, Analysis
The SOCC shall provide the capability to support operations in accordance with the Joint Operations Rules and Procedures (JORP) [AD-14] [PGSL-3.2.2.1-010].

CSU-SOC-3.3-0030   Demo, Analysis
The Backup SOCC shall provide the capability to perform SOCC operational functions necessary to maintain the health and safety of IJPS POES satellites [PSOC-3.3.2.1-025].

CSU-SOC-3.3-0040   Demo
The SOCC shall control the IJPS CE equipment located within the SOCC [PSOC-3.3.2.1-010/025].

3.3.1   Monitor and Control

CSU-SOC-3.3.1-0010   Demo
The SOCC shall provide the capability to configure and control SOCC hardware and software and CE resources located within SOCC to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0020   Demo
The Backup SOCC shall provide the capability to configure and control Backup SOCC hardware and software resources to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0030   Demo
The SOCC shall provide the capability to remotely configure and control IJPS hardware and software resources at the CDASs [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0040   Demo
The SOCC shall monitor the status and control the IJPS hardware and software resources of the CDASs [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0050   Demo
Control of SOCC, Backup SOCC and the CE hardware and software shall be through a) an automated execution of the schedule, and/or b) manual commands [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0060   Demo
The SOCC shall provide IJPS operators with the capability to monitor the real-time data quality of downlink acquisitions from Metop satellites [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0070   Demo
The SOCC shall provide the capability to configure PGS CDAS, SOCC and Communication equipment including any EUMETSAT-provided unique command, telemetry acquisition and/or data acquisition equipment to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.1-150, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0080   Demo
The SOCC shall provide the capability to monitor the state of PGS SOCC, CDAS, and communication equipment and links including any EUMETSAT-provided unique command, telemetry acquisition and/or data acquisition equipment to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDAS-3.3.1.1-150, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0090   Demo
The SOCC and Backup SOCC shall provide the capability to start/stop/reconfigure any real-time stream (data stream defined by data type, source and destination) in support of IJPS operations. [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.1-0100   Demo
In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall have the capability of utilizing the Darmstadt Interface to monitor NOAA-provided instruments on Metop Satellites [PGSL-3.2.2.1-010, PSOC-3.3.2.1-200, PSOC-3.3.2.2-010/030].

CSU-SOC-3.3.1-0110   Demo, Analysis
The SOCC shall provide the capability to monitor the performance of the Suitland Interface [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.3-010].

3.3.2 Telemetry Processing

CSU-SOC-3.3.2-0010   Demo
The SOCC and Backup SOCC shall provide the capability to ingest and process the IJPS POES satellite telemetry (TIP or AIP or HRPT) acquired and provided by EUMETSAT [PSOC -3.3.2.1-025/150, PSOC-3.3.2.2-020].

CSU-SOC-3.3.2-0020   Demo
In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall provide the capability to access state-of-health telemetry data from NOAA instruments on Metop satellites [PSOC-3.3.2.1-200, PSOC-3.3.2.2-030].

CSU-SOC-3.3.2-0030   Demo
The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry received through EPS resources from IJPS POES satellites, and telemetry received through PGS resources from POES (IJPS and pre-IJPS) satellites [PSOC-3.3.2.1-025/150, PSOC-3.3.2.2-020].

CSU-SOC-3.3.2-0040   Demo
The SOCC and Backup SOCC shall provide the capability to extract MHS telemetry from IJPS POES TIP, AIP, HRPT and GAC data streams [PSOC-3.3.2.1-025/180/190].

CSU-SOC-3.3.2-0050   Demo
The SOCC and Backup SOCC shall have the capability to manage extracted IJPS POES MHS telemetry and to provide such telemetry data to the EPS CGS [PSOC-3.3.2.1-025/180/190].

3.3.3 Trending and Analysis

CSU-SOC-3.3.3-0010   Demo
The SOCC and Backup SOCC shall provide the capability to monitor and assess long-term trends in IJPS POES MHS parameters sufficient for anomaly detection and resolution and for nominal instrument command and control purposes [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.3-0020   Demo
The SOCC shall provide the capability to assess CDAS, CE and the Suitland Interface quality of service for Metop blind-orbit cross support [PGSL-3.2.2.4-020/060, PSOC-3.3.2.3-010, PSOC-3.3.2.4-050/060].

3.3.4 Commanding

CSU-SOC-3.3.4-0010   Demo
The SOCC and Backup SOCC shall provide the capability to generate, validate, authenticate, and verify IJPS POES MHS instrument commands including real-time commands [PSOC-3.3.2.1-025, PSOC-3.3.2.2-020].

CSU-SOC-3.3.4-0020   Demo
The SOCC and Backup SOCC shall provide the capability to command MHS instruments by utilizing PGS resources [PSOC-3.3.2.1-025, PSOC-3.3.2.2-020].

CSU-SOC-3.3.4-0030   Demo
The SOCC and Backup SOCC shall provide the capability to command IJPS POES satellites by utilizing the commanding access provided by EUMETSAT through the EPS CGS [PSOC-3.3.2.1-020/025/130, PSOC-3.3.2.2-060].

CSU-SOC-3.3.4-0040   Test, Demo, Analysis
The SOCC and Backup SOCC shall provide the capability to format and transmit commands to the IJPS POES satellites via the EUMETSAT CGS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-025/130].

CSU-SOC-3.3.4-0050   Demo

The SOCC and Backup SOCC shall provide the capability to ingest and process IJPS POES command echoes provided at the Darmstadt interface [PSOC-3.3.2.1-025/140].

CSU-SOC-3.3.4-0060   Test

The SOCC and Backup SOCC shall provide the capability to simultaneously command IJPS POES satellites using EPS resources and POES (IJPS and pre-IJPS) satellites using PGS resources [PSOC-3.3.2.1-025/130, PSOC-3.3.2.2-020/060].

3.3.5 Scheduling

CSU-SOC-3.3.5-0010   Demo

The SOCC shall provide the capability to schedule FCDAS, SOCC and communication resources in support of Metop blind orbit and contingency support operations [PSOC-3.3.2.1-010/050/060/070/080/091].

CSU-SOC-3.3.5-0020   Demo

The SOCC and Backup SOCC shall provide the capability to schedule PGS CDAS, operational SOCC, and communication resources in support of IJPS POES operations and Metop MHRPT data acquisitions [PSOC-3.3.2.1-010/020/025/040/071/091/100/110/130/140/150, PSOC-3.3.2.2-020].

CSU-SOC-3.3.5-0030   Demo

The SOCC and Backup SOCC shall provide the capability to schedule the use of EPS CGS resources for IJPS POES blind orbit and contingency cross-support operations [PSOC-3.3.2.1-010/020/025/040/130/140/150, PSOC-3.3.2.2-020/040/060].

CSU-SOC-3.3.5-0040   Demo, Analysis

The SOCC shall provide the capability to schedule communication resources in support of acquisition of Metop GDS data from the Darmstadt Interface [PSOC-3.3.2.1-025/030].

CSU-SOC-3.3.5-0050   Demo

In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall accept inputs for scheduling from EUMETSAT [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.5-0060   Demo

The SOCC shall provide the capability to utilize antenna RF masks and products from the Metop state vectors to schedule CSU Metop support activities [PSOC-3.3.2.1-025/050/060/070/071/080/091/100].

CSU-SOC-3.3.5-0070   Demo

The SOCC shall make data available to EUMETSAT as specified in the JORP [AD-14] [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.5-0080   Demo
The SOCC and Backup SOCC shall provide the capability to create schedules that include
activities for the management of health and status of IJPS POES MHS instruments [PSOC-
3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.5-0090   Demo
The SOCC and Backup SOCC shall provide the capability to produce and update schedules
based on IJPS space and ground asset maintenance needs [PSOC-3.3.2.1-010/020/025/030/040/
050/060/070/080/090/100/110/120/130/140/150/160/170/190/210].

CSU-SOC-3.3.5-0100   Demo
The SOCC and Backup SOCC shall provide the capability to generate IJPS POES satellite stored
command tables that include commands for MHS instruments [PSOC-3.3.1-025, PSOC-3.3.2.2-
010/020].

3.3.6 Report generation

CSU-SOC-3.3.6-0010   Demo
The SOCC and Backup SOCC shall provide the capability to generate reports used in the
evaluation of PGS/IJPS performance [PGSL-3.2.2.4-020/030/040/050/060/070/080/090/100/110,
PSOC-3.3.2.1-025, PSOC-3.3.2.4-030/040/050/051/060/070].

CSU-SOC-3.3.6-0020   Demo
The SOCC shall provide the capability to compare and report the amount of expected data
frames to actual data frames received for Metop downlink acquisitions at PGS CDASs [PGSL-
3.2.2.4-040/060/070/110, PSOC-3.3.2.4-050/051/060].

CSU-SOC-3.3.6-0030   Demo
The SOCC and Backup SOCC shall provide the capability to compare and report the amount of
expected IJPS POES downlink data frames to actual data frames received through either PGS or
EPS resources [PSOC-3.3.2.4-040].

3.3.7 Database Maintenance

CSU-SOC-3.3.7-0010   Demo, Analysis
The SOCC shall provide the capability to exercise version control of operational databases for
IJPS satellites (POES and Metop) [PSOC-3.3.2.1-120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.7-0020   Demo, Analysis
The Backup SOCC shall provide the capability to exercise version control of operational
databases for IJPS POES satellites [PSOC-3.3.2.1-025/120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.7-0030   Demo, Analysis

The SOCC and Backup SOCC shall provide the capability for database administrators to modify IJPS POES operational databases for IJPS satellites [PSOC-3.3.2.1-025/120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.7-0040   Demo, Analysis

Operational databases shall support IJPS POES MHS instrument operations [PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.7-0050   Test, Analysis

The SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites and two Metop satellites in addition to required pre-IJPS POES satellites [PSOC-3.3.2.1-120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.7-0060   Test, Analysis

The Backup SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites in addition to the required pre-IJPS POES satellites [PSOC-3.3.2.1-025/120, PSOC-3.3.2.2-010/020].

3.3.8 External Interfaces

CSU-SOC-3.3.8-0010   Demo

The operational SOCC (SOCC or Backup SOCC) shall provide the capability to receive the IJPS POES telemetry acquired by EUMETSAT from the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-025/150, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.8-0020   Demo

The SOCC shall provide the capability to receive Metop ephemeris data from IPS [PSOC-3.3.2.1-030/050/060].

CSU-SOC-3.3.8-0030   Demo

The SOCC shall make requested MHS Telemetry available to EUMETSAT at the Darmstadt Interface [PSOC-3.3.2.1-190].

CSU-SOC-3.3.8-0040   Analysis, Demo

The SOCC shall provide IJPS POES MHS Telemetry data in EUs [PSOC-3.3.2.1-190].

CSU-SOC-3.3.8-0050   Demo

The MHS Telemetry data shall be made available in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-190].

CSU-SOC-3.3.8-0060   Analysis, Demo

The SOCC and Backup SOCC shall be capable of a voice exchange with the EPS CGS [PSOC-3.3.2.1-025, PSOC-3.3.2.3-030].

CSU-SOC-3.3.8-0070   Demo
The SOCC shall provide coordination data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21] [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.8-0080   Demo
The SOCC shall receive coordination data from IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21] [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.8-0090   Demo
The SOCC shall provide the capability to acquire one orbit buffer of IJPS POES Global data from the CGS Control Site in Darmstadt [PSOC-3.3.2.1-040].

CSU-SOC-3.3.8-0100   Demo, Analysis
The SOCC shall provide blind-orbit Metop GDS data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21] [NOAA requirement].

CSU-SOC-3.3.8-0110   Demo, Analysis
The SOCC shall provide blind-orbit Metop GDS data to EPS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.4-050]

CSU-SOC-3.3.8-0120   Demo, Analysis
The SOCC shall provide MHRPT data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21] [NOAA requirement].

CSU-SOC-3.3.8-0130   Demo
The SOCC shall provide the capability to receive from the CE the IJPS POES global data that was acquired by EUMETSAT and provided to the Darnstadt Interface [PGSL-3.2.2.1-221, PIPS-3.3.3.1-080].

CSU-SOC-3.3.8-0140   Demo, Analysis
The SOCC shall receive blind-orbit IJPS POES global data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSYS-3.1.3-040, PSOC-3.3.2.1-040].

CSU-SOC-3.3.8-0150   Demo, Analysis
The SOCC shall provide blind-orbit IJPS POES global data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21] [PGSL-3.2.2.1-221, PIPS-3.3.3.1-080].

CSU-SOC-3.3.8-0160   Demo, Analysis

The SOCC shall provide the capability to generate IJPS POES global data backlog tapes in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PGSL-3.2.2.2-060].

CSU-SOC-3.3.8-0170   Demo

The SOCC shall provide the capability to recover IJPS POES global data from backlog tapes provided by EUMETSAT [PGSL-3.2.2.2-061, PSOC-3.3.2.2-080].

CSU-SOC-3.3.8-0180   Demo

The SOCC shall provide the capability to recover Metop GDS data from backlog tapes provided by EUMETSAT and deliver it to IPS [PGSL-3.2.2-061, PSOC-3.3.2.2-080].

CSU-SOC-3.3.8-0190   Demo, Analysis, Test

The SOCC upgrade shall provide the hardware for the SOCC portion of the Suitland Interface [PGSL-3.2.2.3-020].

CSU-SOC-3.3.8-0200   Demo, Analysis

The SOCC shall provide IJPS POES global data to EPS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.4-040].

3.3.9 Performance

CSU-SOC-3.3.9-0010   Test

The SOCC and Backup SOCC shall provide the capability to simultaneously command two IJPS POES satellites utilizing two separate CDASs [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.9-0020   Test

The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry from two IJPS POES satellites acquired by two separate CDASs [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.9-0030   Test, Analysis

The SOCC and Backup SOCC shall provide the capability to control CDAS, operational SOCC, and CE resources in such manner as to ensure that 99.4% (measured over any 30-day period) of the IJPS POES Global data acquired by the PGS is made available to the Suitland Interface in compliance with IJPS timeliness requirements [PSOC-3.3.2.1-025, PSOC-3.3.2.4-040].

CSU-SOC-3.3.9-0040   Test, Analysis

The SOCC shall provide the capability to control CDAS, SOCC, and CE resources in such manner as to ensure that 99.4% (measured over any 30-day period) of Metop GDS blind-orbit data acquired by the FCDAS is made available at the Suitland Interface in compliance with IJPS timeliness requirements [PSOC-3.3.2.4-050].

CSU-SOC-3.3.9-0050   Test, Analysis
The SOCC shall provide the capability to control CDAS, SOCC, and CE resources in such manner as to ensure that 98.8% (measured over any 30-day period) of the TM downlinked by Metop to the FCDAS is made available to the Suitland Interface in compliance with IJPS timeliness requirements [PSOC-3.3.2.4-060].

CSU-SOC-3.3.9-0060   Test, Analysis
The SOCC shall provide the capability to control CDAS, SOCC, and CE resources in such manner as to ensure that 98.8% (measured over any 30-day period) of the Metop TC provided at the Suitland Interface are successfully uplinked by the FCDAS to Metop in compliance with IJPS timeliness requirements [PGSL-3.2.2.2-040].

CSU-SOC-3.3.9-0070   Test, Analysis
The SOCC and Backup SOCC shall provide the capability to reconstitute an IJPS GAC acquisition chain through a CDAS to the Suitland Interface in less than 360 minutes [PSOC-3.3.2.1-025, PSOC-3.3.2.4-020].

CSU-SOC-3.3.9-0080   Test, Analysis
The SOCC shall provide the capability to reconstitute the GDS acquisition chain through the FCDAS to the Suitland Interface in less than 360 minutes [PSOC-3.3.2.4-020].

CSU-SOC-3.3.9-0090   Test, Analysis
The SOCC shall provide the capability to reconstitute the Metop TM acquisition chain through the FCDAS to the Suitland Interface in less than 100 minutes [PSOC-3.3.2.4-031].

CSU-SOC-3.3.9-0100   Test, Analysis
The SOCC shall provide the capability to reconstitute the Metop TC transmission chain from the Suitland Interface through the FCDAS in less than 100 minutes [PSOC-3.3.2.4-030].

CSU-SOC-3.3.9-0110   Test, Analysis
The SOCC and Backup SOCC shall provide the capability to reconstitute an MHRPT acquisition chain through a CDAS to the IPS in less than 360 minutes [PGSL-3.2.2.4-110, PSOC-3.3.2.1-025].

CSU-SOC-3.3.9-0120   Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control CDAS, operational SOCC, and CE resources in such a manner as to ensure that 99.4% (measured over any 30-day period) of the MHRPT data acquired by the PGS is made available to the IPS within timeliness requirements [PGSL-3.2.2.4-110, PSOC-3.3.2.1-025, PSOC-3.3.2.4-051].

CSU-SOC-3.3.9-0130   Demo
The SOCC and Backup SOCC shall provide the capability to generate a conflict-free schedule for up to two IJPS POES satellites and one Metop satellite [PSOC-3.3.2.1-010/025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.9-0140   Test, Analysis
In accordance with IJPS GAC timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface 99.8% (measured over any 30-day period) of the IJPS POES global data received from the CE [PSOC-3.3.2.4-040].

CSU-SOC-3.3.9-0150   Test, Analysis
In accordance with GDS timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface 99.8% (measured over any 30-day period) of the Metop GDS received from the CE [PSOC-3.3.2.4-050].

CSU-SOC-3.3.9-0160   Test, Analysis
In accordance with Metop telemetry timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface 99.8% (measured over any 30-day period) of the Metop telemetry received from the CE [PSOC-3.3.2.4-060].

CSU-SOC-3.3.9-0170   Test, Analysis
In compliance with Metop TC timeliness requirements, the SOCC shall deliver to the CE 99.8% (measured over any 30-day period) of the Metop TC received at the Suitland Interface [PGSL-3.2.2.2-040].

CSU-SOC-3.3.9-0180   Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control CE resources in such a manner as to ensure that TBD% (measured over a 30-day period) of the Metop IASI, GRAS, ASCAT and GOME-2 products made available at the Darmstadt Interface are transferred to the IPS within timeliness requirements [PGSL-3.2.2.3-020, PSOC-3.3.2.1-030].

CSU-SOC-3.3.9-0190   Test, Analysis
The SOCC shall deliver blind-orbit Metop GDS data to IPS within TBD of receipt [NOAA requirement].

CSU-SOC-3.3.9-0200   Test, Analysis
The SOCC shall deliver blind-orbit IJPS POES global data to IPS within TBD of receipt [NOAA requirement].

CSU-SOC-3.3.9-0210   Test, Analysis
The SOCC shall provide a data buffer for PGS acquired IJPS POES global data to contain, at all times, a minimum of one complete download [PGSL-3.2.2.3-035].

CSU-SOC-3.3.9-0220   Test, Analysis
The SOCC shall provide a data buffer for blind-orbit Metop GDS data to contain, at all times, a minimum of one complete download [PGSL-3.2.2.3-035].

CSU-SOC-3.3.9-0230   Test

The SOCC shall provide the capability to generate backlog tapes containing requested IJPS POES global data within TBD of receiving the request [PGSL-3.2.2.2-060].

CSU-SOC-3.3.9-0240   Test, Analysis

The SOCC shall provide the capability to store at least seven days of IJPS POES global data for later playback [PGSL-3.2.2.2-020/060, PGSL-3.2.2.3-031].

CSU-SOC-3.3.9-0250   Test, Analysis

TBD% of IJPS POES global data sent to archive at the SOCC shall be retrievable [PGSL-3.2.2.2-060].

3.3.10 Test and Training

CSU-SOC-3.3.10-0010   Demo

The SOCC's and Backup SOCC's IJPS POES satellite emulation/simulation shall have the ability to receive command echoes provided by the EPS CGS [PSOC-3.3.2.1-025/140].

4.   Keywords with Definitions

Blind Orbit – Orbit that could not be acquired by the satellite nominal ground station, i.e., Fairbanks and Wallops for NOAA and EPS CDAS (located in Svalbard, a Norwegian Territory) for Metop. The reasons for not being able to acquire the data include: failure scenarios, non-visibility from the ground station, cross-support for satellite operations upon request for specific operations.

Communications Element (CE) – The CE provides the communications network infrastructure and connections between the Suitland and the Darmstadt interfaces, and among the PGS elements.

Global data – IJPS global data is Metop GDS data or IJPS POES global data. IJPS POES global data can be any of the following: GAC, STIP or SAIP. GAC is provided when available but STIP or SAIP can be substituted when GAC is not available.

Pipeline Mode – Data of one orbit is continuously transmitted, processed and distributed within the time of the next orbit.

Split Mission – Data from two satellites is required to fulfill the mission of one satellite.

Suitland Interface – NOAA's single point interface is located in Suitland, MD, which allows EPS to acquire IJPS satellite data and information, per mutual agreement.

TBC – The qualification TBC (To Be Confirmed) associated with a statement or quantity indicates items that need to be further analyzed before a final decision. A requirement that is TBC is contractually a requirement.

TBD – The qualification TBD (To Be Determined) associated with a statement or quantity indicates items that are unknown at this time and must be determined in the future. A requirement that is TBD may not eventually remain a requirement.

TBW – The qualification TBW (To Be Written) indicates a document yet to be written.

Throughput Mode – Data are transmitted without any other delay than required for the transmission itself and the data throughput IN equals the data throughput OUT.

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5.   Open Issues

5.1   TBC

CSU-CR-3.1.11-0010   Test
The CSU shall deliver the first IJPS GAC data via the CE to the Suitland Interface no later than 120 seconds after loss of signal. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.

CSU-CR-3.1.11-0020   Test
The CSU shall complete delivery of IJPS GAC data to the Suitland Interface no later than 100 minutes after completion of the GAC dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds to complete the delivery of the last data item.

CSU-CR-3.1.11-0040   Test
The CSU shall deliver the first Metop GDS data via the CE to the Suitland Interface no later than 120 seconds after completion of the GDS dump. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.

CSU-CR-3.1.11-0050   Test
The CSU shall complete delivery of Metop GDS data to the Suitland Interface no later than 100 minutes after completion of the GDS dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds to complete the delivery of the last data item.

CSU-CR-3.1.11-0060   Test
The delay between the completion of the Metop TM frame acquisition at the FCDAS and its delivery via the CE to the Suitland Interface shall be less than 1 second. The CSU shall be allocated .75 seconds (TBC) of the 1 second.

CSU-CR-3.1.11-0070   Test
Metop TC shall be uplinked to the Metop satellite within 1 second of receipt at the Suitland Interface. The CSU shall be allocated .75 seconds (TBC) of the 1 second.

CSU-CDA-3.2.7-0080   Test
The FCDAS shall time-tag Metop TM data with an accuracy of better than 50 microseconds (TBC) of UTC.

CSU-CDA-3.2.7-0090   Test
The FCDAS shall time-tag Metop GDS data with an accuracy of better than 100 microseconds (TBC) of UTC.

5.2 TBD

CSU-CDA-3.2.3-0070   Demo
FCDAS and WCDAS shall provide the capability to append quality flags to MHRPT VCDUs to
be sent to the IPS (TBD).

CSU-CDA-3.2.5-0030   Demo
The FCDAS shall provide the capability to store and retrieve Metop real-time TM. (TBD)

CSU-CDA-3.2.7-0070   Test
FCDAS shall provide the capability to generate backlog tapes containing requested archived
Metop GDS data within TBD of receiving the request.

CSU-CDA-3.2.7-0150   Test, Analysis
FCDAS and WCDAS shall complete data processing for selected MHRPT VCDUs and delivery
to the CE within TBD of the completion of the acquisition of the frame containing that data.

CSU-CDA-3.2.7-0160   Test, Analysis
The SOCC shall deliver MHRPT data to IPS within TBD of receipt. [NOAA requirement]

CSU-CDA-3.2.7-0170   Test, Analysis
TBD% of the IJPS global data sent to archive at a CDAS shall be retrievable.

CSU-SOC-3.3.7-0050   Test, Analysis
The SOCC shall provide the capability to maintain constellation information on up to TBD IJPS
POES satellites and two Metop satellites in addition to required pre-IJPS POES satellites.

CSU-SOC-3.3.7-0060   Test, Analysis
The Backup SOCC shall provide the capability to maintain constellation information on up to
TBD IJPS POES satellites in addition to the required pre-IJPS POES satellites.

CSU-SOC-3.3.9-0180   Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control CE resources in such a
manner as to ensure that TBD% (measured over a 30-day period) of the Metop IASI, GRAS,
ASCAT and GOME-2 products made available at the Darmstadt Interface are transferred to the
IPS within timeliness requirements.

CSU-SOC-3.3.9-0190   Test, Analysis
The SOCC shall deliver blind-orbit Metop GDS data to IPS within TBD of receipt [NOAA
requirement].

CSU-SOC-3.3.9-0200   Test Analysis
The SOCC shall deliver blind-orbit IJPS POES global data to IPS within TBD of receipt.
[NOAA requirement]

CSU-SOC-3.3.9-0230   Test

The SOCC shall provide the capability to generate backlog tapes containing requested IJPS POES global data within TBD of receiving the request.

CSU-SOC-3.3.9-0250   Test, Analysis

TBD% of IJPS POES global data sent to archive at the SOCC shall be retrievable.

5.3   TBW

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Appendix A.   Requirements Matrix

Req't ID	Req't Statement	Source Req't	Allocated Req't	Verification Level & Method			Comments
				Ele	PGS	IJPS	
	3.1 CDAS/SOCC Upgrade Common Requirements						
CSU-CR-3.1-0010	The CSU shall not impact the ability of the PGS to meet existing POES System requirements.	RDN-4 Section 3.2.2, PGSL-3.2.2.1-010		D, A			
CSU-CR-3.1-0020	The CSU shall provide, at a minimum, identical functionality for IJPS POES satellites as that provided for POES satellites by the POES CDASs and SOCC.	RDN-4 Section 3.2.2 PGSL-3.2.2.1-010		D, A			
CSU-CR-3.1-0030	The CSU shall be compatible with the EUMETSAT Ground Segment regarding required data exchange.	PGSL-3.2.2.3-020/021/025/030/040/050/060/070/080 PCDAS-3.3.1.1-040/080/090/100/120		A, T			
CSU-CR-3.1-0040	The CSU shall support continuous, 24-hours-a-day, seven-days-a-week operations.	PGSL-3.2.2.1-010		D, A			
CSU-CR-3.1-0050	The CSU shall provide tools necessary for a trained operator to accomplish allocated tasks within allocated time and system performance requirements.	PSYS-3.1.4-020 PGSL-3.2.2.1-010		D, A			
CSU-CR-3.1-0060	The CSU shall support IJPS POES split mission operations.	PCDAS-3.3.1.1-110 PSOC-3.3.2.1-020/040/130/140/150/170/180/190/205		A			
CSU-CR-3.1-0070	The CSU shall support IJPS operations, backlog processing, reprocessing, validation processing, and system testing (IJPS and PGS).	PGSL-3.2.2.2-010/030 PCDAS-3.3.1.2-020/030/040, RDN-4 Section 4		D, A		I	

Req't ID	Req't Statement	Source Req't	Allocated Req't	Verification Level & Method			Comments
				Ele	PGS	IJPS	
	3.1.1 Monitor and control						
CSU-CR-3.1.1-0010	CSU shall not degrade the current SOCC and CDAS system capabilities to protect data, software and processes against destruction, denial of service, unauthorized modification and disclosure to unauthorized individuals.	PGSL-3.2.2.1-010		A			
CSU-CR-3.1.1-0020	CSU system modifications relating to control, monitoring, and reporting shall be capable of being integrated into the existing CDAS/SOCC POES baseline system.	PGSL-3.2.2.1-010		D			
CSU-CR-3.1.1-0030	The CSU shall provide the capability for operators to monitor new equipment configurations used in support of IJPS satellites.	PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030 PSOC-3.3.2.1-010		D			
CSU-CR-3.1.1-0040	The CSU shall provide the capability for operators to monitor schedule execution in support of Metop satellites and new IJPS POES satellite activities.	PGSL-3.2.2.1-010 PCDAS-3.3.1.1-020/025/050 PCDAS-3.3.1.2-020 PSOC-3.3.2.1-010/020/030/040/050/060/070/071/080/091/100/110/130/140/150/160/170/190/210		D			

Req't ID	Req't Statement	Source Req't	Allocated Req't	Verification Level & Method			Comments
				Ele	PGS	IJPS	
CSU-CR-3.1.1-0050	The CSU shall provide the capability to monitor operational status of hardware, equipment, software, internal networks and external networks, used to support IJPS satellites.	PGSL-3.2.2.4-020 PCDAS-3.3.1.2-020 PCDAS-3.3.1.4-030/040/050/060/070/080/090 PSOC-3.3.2.1-010 PSOC-3.3.2.4-020/030/031/040/050/051/060		D			
CSU-CR-3.1.1-0060	The CSU shall provide the capability to detect and notify operators of frame data errors, frame losses, and sync losses in a) Metop satellite telemetry, b) Metop GDS data streams, and c) MHRPT data streams received at the PGS CDASs	PGSL-3.2.2.4-020/060/070 PCDAS-3.3.1.2-020 PCDAS-3.3.1.4-030/070/080		D			
CSU-CR-3.1.1-0070	The CSU shall provide the capability to notify operators of an out-of-nominal condition for hardware and software resources delivered by the CSU development.	PGSL-3.2.2.4-020 PCDAS-3.3.1.2-020 PCDAS-3.3.1.4-030/040 PSOC-3.3.2.1-010		D			
CSU-CR-3.1.1-0080	The CSU shall provide the capability to point ground antennas at and to track Metop satellites to support commanding and downlink data collection.	PCDAS-3.3.1.1-020/025/050 PCDAS-3.3.1.2-020 PSOC-3.3.2.1-050/060/080		D			
	3.1.2 Commanding and Telemetry processing						
CSU-CR-3.1.2-0010	Metop TC shall pass through the CSU in a throughput mode from the Suitland Interface.	PGSL-3.2.2.2-040 PCDAS-3.3.1.1-040/050		D			
CSU-CR-3.1.2-0020	Metop telemetry shall pass through the CSU in a throughput mode to the Suitland Interface.	PGSL-3.2.2.2-040 PCDAS-3.3.1.1-040/050		D			

Req't ID	Req't Statement	Source Req't	Allocated Req't	Verification Level & Method			Comments
				Ele	**PGS**	**IJPS**	
CSU-CR-3.1.2-0030	FCDAS, WCDAS and the SOCC shall provide the capability to monitor the health and status of IJPS POES MHS instruments in real time.	PSOC-3.3.2.1-025/180/190		D			
CSU-CR-3.1.2-0040	FCDAS, WCDAS and the SOCC shall be able to ingest, decommutate, archive and trend IJPS POES MHS telemetry	PSOC-3.3.2.1-025/180/190		D			
	3.1.3 Data Storage						
CSU-CR-3.1.3-0010	The CSU shall provide the capability to associate attributes with each piece of Metop recorded and archived data to include, at a minimum: a) date and time, b) data identifier, c) satellite ID, and d) orbit number.	PGSL-3.2.2.1-010 PCDAS-3.3.1.2-040 PCDAS-3.3.1.4-020		D			
CSU-CR-3.1.3-0020	The CSU shall provide the capability to retrieve recorded and archived Metop data by data identifier and the following sort criteria, at a minimum: a) date and time, b) satellite ID, and c) orbit number.	PGSL-3.2.2.1-010 PCDAS-3.3.1.2-030/040		D			
	3.1.4 Anomalies and Contingency						
CSU-CR-3.1.4-0010	The CSU shall provide the capability to recognize and continue operations in the event that IJPS POES data received from the Darmstadt Interface is corrupt (e.g. corrupted at source), is duplicated (e.g. downlinked twice), is out of time sequence, is incomplete, or is missing (e.g. between passes).	PGSL-3.2.2.1-010 PCDAS-3.3.1.1-020/025/050/080 PSOC-3.3.2.1-010/020/030/040/050/060/070/080/090/100/110/130/150/160/170/190/210		T			

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				Ele	*PGS*	*IJPS*	
CSU-CR-3.1.4-0020	The CSU shall provide to operators the capability to direct the failover to redundant CSU equipment and interfaces in the event of failure of on-line equipment or interfaces.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-020 PCDAS-3.3.1.4-030/040/070/080/090 PSOC-3.3.2.1-020/030/040/050/060/070/071/080/091/100/110/140/150/160/170/190/210 PSOC-3.3.2.4-040/050/051/060		D			
CSU-CR-3.1.4-0030	The CSU shall provide capabilities that aid in detecting, diagnosing and resolving anomalies in the IJPS POES MHS instruments.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 -		D,A			
CSU-CR-3.1.4-0040	The CSU shall provide capabilities that aid in detecting, diagnosing and resolving anomalies in CSU ground resources.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030		D,A			
CSU-CR-3.1.4-0050	The CSU shall provide support to the investigation and response to in-orbit anomalies and emergency situations related to the NOAA-provided instruments on Metop satellites.	PCDAS-3.3.1.1-080 PSOC-3.3.2.1-50/60/120/200		D,A			
	3.1.5 Operational Requirements						
CSU-CR-3.1.5-0010	The CSU shall be capable of providing support to Metop satellite operations upon the successful completion of the SCR for that Metop satellite.	PCDAS-3.3.1.2-010 PSOC-3.3.2.2-010		D.A			

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CSU-CR-3.1.5-0020	The CSU shall be capable of supporting IJPS POES satellite operations upon the successful completion of the On-orbit Verification Review for that POES satellite.	PCDAS-3.3.1.2-010 PSOC-3.3.2.2-010		D.A			
CSU-CR-3.1.5-0030	The CSU shall provide the capability to support Early Orbit testing of IJPS POES Satellites simultaneously with normal IJPS operations.	RDN-4 Section 3.2.2 PGSL-3.2.2.1-010		D,A			
CSU-CR-3.1.5-0040	The CSU shall provide the capability to support IJPS POES satellite pre-launch activities simultaneously with normal IJPS operations.	RDN-4 Section 3.2.2 PGSL-3.2.2.1-010		D,A			
CSU-CR-3.1.5-0050	The CSU shall provide the capability to support IJPS POES satellite commissioning activities simultaneously with normal IJPS operations.	RDN-4 Section 3.2.2 PGSL-3.2.2.1-010		D,A			
CSU-CR-3.1.5-0060	For instruments provided by NOAA to Metop 1 and 2, the CSU shall provide the ability to support Metop post launch checkout, commissioning and operations using the Operational Support Entities in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PIP-6.2,Item 3 PIP-5.2.2		D,A			
CSU-CR-3.1.5-0070	The CSU shall provide the capability to complete the transfer of IJPS Satellite Global data (GAC/STIP/SAIP, GDS) for orbit N, via the CE, to the Suitland Interface prior to the start of pre-pass activities for Orbit N+1.	PGSL-3.2.2.1-190 PCDAS-3.3.1.1-120 PSOC-3.3.2.1-210		D,A			
	3.1.6 Test and V&V Support						
CSU-CR-3.1.6-0010	All necessary test points shall be provided within the CSU that are required to perform in a repeatable fashion the integration, verification and acceptance of the CSU.	PGSL-3.2.2.1-010 PGSL-3.2.2.2-010/030 PGSL-3.2.2.3-020/050 RDN-4 Section 4		A			

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CSU-CR-3.1.6-0020	All necessary data injection points shall be provided within the CSU to perform in a repeatable fashion the integration, verification and acceptance of the CSU and to support space vehicle testing.	PGSL-3.2.2.1-010 PGSL-3.2.2.2-010/030 PGSL-3.2.2.3-020/050 RDN-4 Section 4		A			
	3.1.7 External Interfaces						
CSU-CR-3.1.7-0010	The CSU shall deliver data, in formats in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], to the Suitland Interface.	PGSL-3.2.2.3-020/030		T, A			
CSU-CR-3.1.7-0020	The CSU (in conjunction with the CE) shall make NOAA IJPS POES Global data available to the Suitland Interface in a manner that allows such data to be transmitted in pipeline mode to EUMETSAT.	PGSL-3.2.2.3-020/030		D,A			
CSU-CR-3.1.7-0030	The CSU (in conjunction with the CE) shall make Metop GDS data available to the Suitland Interface in pipeline mode.	PGSL-3.2.2.3-020/030		D			
CSU-CR-3.1.7-0040	If GAC data is unavailable from an IJPS POES satellite, the CSU shall provide CDAS acquired SAIP or STIP at the Suitland interface.	PGSL-3.2.2.1-070/150/160 PCDAS-3.3.1.4-090 PSOC-3.3.2.1-160		D			
	3.1.8 Maintainability						
CSU-CR-3.1.8-0010	The CSU upgrades shall be maintainable over the IJPS lifetime.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.8-0020	It shall be possible to perform failure investigation (e.g., H/W, S/W and communication investigations) in parallel with, but without detrimental impact on, normal operations.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A,I			
CSU-CR-3.1.8-0030	It shall be possible to perform hardware and software maintenance activities on the CSU in parallel with, but without detrimental impact on, normal operations.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A,I			

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CSU-CR-3.1.8-0040	It shall be possible to release a new version of any configuration controlled CSU item without detrimental impact on the availability of the PGS.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A,I			
CSU-CR-3.1.8-0050	CSU hardware shall be developed and selected such that maintenance can be performed on site.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		D,A,I			
CSU-CR-3.1.8-0060	The CSU shall provide on-line help to operators for any new or modified software.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		D			
	3.1.9 Reliability, Dependability and Availability						
CSU-CR-3.1.9-0010	The CSU shall provide diagnostics and system configuration programs for fault detection (failure and degradation), fault isolation, indication alarms and control necessary to meet reliability and availability requirements.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		D,A,I			
CSU-CR-3.1.9-0020	Automated and/or manual diagnostics to isolate faults to the LRU shall be provided for all CSU installed equipment.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		D,A			
CSU-CR-3.1.9-0030	The downtime of the CSU IJPS GAC acquisition chain from a CDAS antenna to the Suitland Interface shall not exceed 360 minutes.	PGSL-3.2.2.4-080		A			
CSU-CR-3.1.9-0040	The downtime of the CSU Metop GDS acquisition chain from the FCDAS antenna to the Suitland Interface shall not exceed 360 minutes.	PGSL-3.2.2.4-080		A			
CSU-CR-3.1.9-0050	The downtime of the CSU Metop TM acquisition chain from the FCDAS antenna to the Suitland Interface shall not exceed 100 minutes.	PGSL-3.2.2.4-070		A			
CSU-CR-3.1.9-0060	The downtime of the CSU Metop TC transmission chain from the Suitland Interface through the FCDAS antenna shall not exceed 100 minutes.	PGSL-3.2.2.4-090		A			

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CSU-CR-3.1.9-0070	The CSU shall have an overall system availability of 99.6%.	PGSL-3.2.2.4-020		T,A			
CSU-CR-3.1.9-0080	The downtime of the CSU MHRPT acquisition chain from a CDAS antenna to the IPS shall not exceed 360 minutes.	PGSL-3.2.2.4-110		A			
	3.1.10 Design						
CSU-CR-3.1.10-0010	CSU delivered hardware shall be capable of interfacing with existing PGS hardware.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0020	CSU hardware equipment, operating system and COTS software shall be selected from product families: 1) whose availability is projected to be ensured over the IJPS PGS lifetime, and 2) that ensure upward compatibility between the successive versions of a given product.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0030	The CSU hardware shall be developed or selected to be supportable or upgradable over the IJPS PGS design life.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0040	The CSU software shall be developed or selected to be supportable or upgradable over the IJPS PGS design life	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0050	Each of the CSU sub-elements shall offer the necessary level of modularity to allow system functional or performance evolutions with limited impact on the system design.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0060	The CSU hardware design shall support the update of operational hardware without disruptions to mission functions that exceed IJPS reliability, availability and dependability requirements.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0070	Hardware delivered by the CSU development shall not increase CDAS and SOCC facility thermal and humidity control requirements	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A,I			

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CSU-CR-3.1.10-0080	New CSU equipment shall be sized with 50% computer reserve capacity for input/output and processor computing throughput during any period of peak load conditions.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A,T			
CSU-CR-3.1.10-0090	New CSU equipment shall provide sufficient disk storage to meet CSU IJPS requirements with 50% reserve.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0100	The CSU LANs shall provide sufficient bandwidth to meet CSU IJPS requirements with 50% reserve.	PGSL-3.2.2.4-020 PCDAS-3.3.1.4-030/040		A,T			
	3.1.11 Performance						
CSU-CR-3.1.11-0010	The CSU shall deliver the first IJPS GAC data via the CE to the Suitland Interface no later than 120 seconds after loss of signal. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds	PGSL-3.2.2.4-030		T			
CSU-CR-3.1.11-0020	The CSU shall complete delivery of IJPS GAC data to the Suitland Interface no later than 100 minutes after completion of the GAC dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds to complete the delivery of the last data item.	PGSL-3.2.2.4-030		T			
CSU-CR-3.1.11-0030	During split mission operation the CSU shall provide the capability to process and deliver to the Suitland Interface any of the following, with the same performance as during nominal operations: a) 2 orbits of GAC b) 1 orbit GAC and 1 orbit of SAIP c) 1 orbit GAC and 1 orbit of STIP d) 2 orbits of SAIP e) 1 orbit of SAIP and 1 orbit of STIP f) 2 orbits of STIP	PCDAS-3.3.1.1-110 PSOC-3.3.2.1-170		T			

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				Ele	*PGS*	*IJPS*	
CSU-CR-3.1.11-0040	The CSU shall deliver the first Metop GDS data via the CE to the Suitland Interface no later than 120 seconds after completion of the GDS dump. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.	PGSL-3.2.2.4-040		T			
CSU-CR-3.1.11-0050	The CSU shall complete delivery of Metop GDS data to the Suitland Interface no later than 100 minutes after completion of the GDS dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds to complete the delivery of the last data item.	PGSL-3.2.2.4-040		T			
CSU-CR-3.1.11-0060	The delay between the completion of the Metop TM frame acquisition at the FCDAS and its delivery via the CE to the Suitland Interface shall be less than 1 second. The CSU shall be allocated .75 seconds (TBC) of the 1 second.	PGSL-3.2.2.4-070		T			
CSU-CR-3.1.11-0070	Metop TC shall be uplinked to the Metop satellite within 1 second of receipt at the Suitland Interface. The CSU shall be allocated .75 seconds (TBC) of the 1 second.	PGSL-3.2.2.2-040 PSOC-3.3.2.4-070		T			
CSU-CR-3.1.11-0080	The CSU shall complete delivery to the IPS via the CE of filtered MHRPT VCDUs data within 30 minutes post-pass.	PGSL-3.2.2.4-110		T,A			
CSU-CR-3.1.11-0090	The CSU shall ensure that 98.4% (measured over any 30-day period) of the filtered MHRPT VCDUs are delivered via the CE to the IPS within timeliness requirements.	PGSL-3.2.2.4-110		T,A			
CSU-CR-3.1.11-0100	CSU performance requirements (CSU-CR-3.1.11-0010, CSU-CR-3.1.11-0020, CSU-CR-3.1.11-0030) shall be met when SAIP or STIP data is provided to the Suitland interface instead of GAC data.	PGSL-3.2.2.1-070		T,A			

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CSU-CR-3.1.11-0110	The CSU shall provide the capability to exercise cross support functions for one operational Metop satellite at a time. (Note: Requests for additional support will be accommodated within these intrinsic capabilities.)	PGSL-3.2.2.1-120 PCDAS-3.3.1.1-080 PSOC-3.3.2.1-120		A			
	3.2 Upgraded CDAS-Unique Requirements						
CSU-CDA-3.2-0010	FCDAS and WCDAS shall provide the capability to carry out all necessary pre-pass, pass and post-pass CDAS activities for Metop.	PGSL-3.2.2.1-010, RDN-4 Section 3.3.1 PCDAS-3.3.1.2-010		D,A			
	3.2.1 Monitor and Control						
CSU-CDA-3.2.1-0010	FCDAS and WCDAS shall provide the capability to locally configure and control IJPS CDAS hardware and software.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0020	Local control of the new CSU hardware and software shall be through a) local automated execution of the schedule, and/or b) manual commands.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0030	FCDAS and WCDAS shall provide the capability to override automated sequences.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			

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CSU-CDA-3.2.1-0040	FCDAS and WCDAS shall provide the capability to configure and control local CDAS antennas for IJPS support.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0050	FCDAS and WCDAS shall provide the capability to configure and control local IJPS RF processing equipment for Metop support.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0060	FCDAS and WCDAS shall provide the ability to reconfigure CSU hardware during IJPS satellite contacts.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0070	FCDAS and WCDAS shall provide the capability to locally monitor IJPS hardware and software resources.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D,A			
CSU-CDA-3.2.1-0080	FCDAS and WCDAS shall provide the capability to monitor CDAS operations in support of IJPS.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D			

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CSU-CDA-3.2.1-0090	FCDAS and WCDAS shall provide the capability to monitor the data quality of downlink acquisitions from Metop satellites.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.2-010 PCDAS-3.3.1.4-030/040		D,A			
	3.2.2 Data acquisition						
CSU-CDA-3.2.2-0010	FCDAS and WCDAS shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support downlink data collection.	PCDAS-3.3.1.1-020/030 PCDAS-3.3.1.3-010 PCDAS-3.3.1.4-030		D			
CSU-CDA-3.2.2-0020	The FCDAS shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support commanding.	PCDAS-3.3.1.1-050 PCDAS-3.3.1.3-010 PCDAS-3.3.1.4-040		D,A			
CSU-CDA-3.2.2-0030	The FCDAS shall provide the capability to auto-track Metop satellite S-band, L-band and X-band downlinks.	PCDAS-3.3.1.1-020/025/030 PCDAS-3.3.1.3-010 PCDAS-3.3.1.4-030		D			
CSU-CDA-3.2.2-0040	The FCDAS shall provide the capability to program-track during Metop satellite S-band, L-band and X-band downlinks.	PCDAS-3.3.1.1-020/025 PCDAS-3.3.1.3-010 PCDAS-3.3.1.4-030		D			
CSU-CDA-3.2.2-0050	The WCDAS shall provide the capability to auto-track Metop satellite L-band downlinks.	PCDAS-3.3.1.1-025		D			
CSU-CDA-3.2.2-0060	The WCDAS shall provide the capability to program-track during Metop satellite L-band downlinks.	PCDAS-3.3.1.1-025		D			

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CSU-CDA-3.2.2-0070	The FCDAS shall provide the capability to acquire Metop GDS X-band data in accordance with the Metop Space to Ground Interface specification [AD-16].	PCDAS-3.3.1.3-010		D			
CSU-CDA-3.2.2-0080	FCDAS and WCDAS shall provide the capability to acquire MHRPT L-band data in accordance with the Metop Space to Ground Interface Specification [AD-16].	PCDAS-3.3.1.3-010		T			
CSU-CDA-3.2.2-0090	The FCDAS shall provide the capability to acquire Metop TM S-band data in accordance with the Metop Space to Ground Interface Specification [AD-16].	PCDAS-3.3.1.3-010		T			
CSU-CDA-3.2.2-0100	The FCDAS shall provide bit synchronization for Metop downlink streams in accordance with the Metop Space to Ground Interface Specification [AD-16}.	PCDAS-3.3.1.3-010		T			
CSU-CDA-3.2.2-0110	The FCDAS shall provide demodulation for Metop downlink data streams in accordance with the Metop Space to Ground Interface Specification [AD-16].	PCDAS-3.3.1.3-010		T			
CSU-CDA-3.2.2-0120	The WCDAS shall provide a) bit synchronization and b) demodulation for MHRPT downlink data streams in accordance with the Metop Space to Ground Interface Specification [AD-16].	PGSL-3.2.2.4-110 PCDAS-3.3.1.3-010		T			
CSU-CDA-3.2.2-0130	The FCDAS shall perform RF processing and data routing of Metop downlinked data.	PGSL-3.2.2.4-110 PCDAS-3.3.1.1-020/025/030 PCDAS-3.3.1.3-010		D			
CSU-CDA-3.2.2-0140	FCDAS and WCDAS shall perform RF processing and data routing of MHRPT data.	PGSL-3.2.2.4-110 PCDAS-3.3.1.1-025/030 PCDAS-3.3.1.3-010		D			

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CSU-CDA-3.2.2-0150	The FCDAS shall provide the capability to ingest test data at various points within each Metop S-band, L-band, and X-band acquisition chain.	PCDAS-3.3.1.4-030, RDN-4 Section 4		D			
CSU-CDA-3.2.2-0160	The WCDAS shall provide the capability to ingest test data at various points within each Metop L-band acquisition chain.	PCDAS-3.3.1.4-030, RDN-4 Section 4		D			
	3.2.3 Data Processing						
CSU-CDA-3.2.3-0010	The FCDAS shall provide the capability to a) frame synchronize, b) de-randomize , c) Reed-Solomon decode, d) VCDU error correct, and e) remove fill data from Metop GDS data.	PCDAS-3.3.1.1-060 PCDAS-3.3.1.4-080		D			
CSU-CDA-3.2.3-0020	The FCDAS shall provide the capability to append a quality flag (i.e. GOOD/BAD) to the Metop GDS data, based on the Reed -Solomon information, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.1-060 PCDAS-3.3.1.4-080		D			
CSU-CDA-3.2.3-0030	The FCDAS shall provide the capability to append a UTC time stamp to the Metop GDS data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.1-060 PCDAS-3.3.1.4-080		D			
CSU-CDA-3.2.3-0040	The FCDAS shall provide the capability to UTC time stamp Metop TM data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.1-070 PCDAS-3.3.1.4-070		T			
CSU-CDA-3.2.3-0050	FCDAS and WCDAS shall provide the capability to a) viterbi decode, b) frame synchronize, c) de-radomize, and d) Reed-Solomon decode Metop HRPT data.	PCDAS-3.3.1.1-030		D			
CSU-CDA-3.2.3-0060	FCDAS and WCDAS shall provide the capability to extract selected VCDUs from the MHRPT data stream.	PCDAS-3.3.1.1-030		D			

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				Ele	PGS	IJPS	
CSU-CDA-3.2.3-0070	FCDAS and WCDAS shall provide the capability to append quality flags to MHRPT VCDUs to be sent to the IPS (TBD).	PCDAS-3.3.1.1-030		D			
CSU-CDA-3.2.3-0080	The FCDAS shall provide the capability to extract selected VCDUs (with appended time stamp and quality flag) from the Metop GDS data stream	NOAA Requirement		D			
	3.2.4 Commanding						
CSU-CDA-3.2.4-0010	The FCDAS shall provide the capability to encode and transmit Telecommands to Metop satellites in accordance with the Metop Space to Ground Interface specification [AD-16].	PCDAS-3.3.1.1-050		T			
CSU-CDA-3.2.4-0020	The FCDAS shall immediately uplink Metop Telecommands without alteration.	PCDAS-3.3.1.1-050		D			
CSU-CDA-3.2.4-0030	The FCDAS shall provide the capability to inject test data into the Metop S-band commanding chain.	PCDAS-3.3.1.4-040 RDN-4 Section 4		D			
CSU-CDA-3.2.4-0040	The FCDAS shall provide the capability to generate Metop telecommand echoes in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.1-090		T			
	3.2.5 Archiving and Data Storage						
CSU-CDA-3.2.5-0010	The FCDAS and WCDAS shall utilize existing capabilities to provide a seven-day rolling archive of IJPS POES global data acquired by that CDAS.	PCDAS-3.3.1.4-020		T,D,A			
CSU-CDA-3.2.5-0020	The FCDAS shall provide the capability to store at least 7 days of Metop GDS data for later playback.	PCDAS-3.3.1.1-140 PCDAS-3.3.1.4-020		D			
CSU-CDA-3.2.5-0030	The FCDAS shall provide the capability to store and retrieve Metop real-time TM. (TBD)	PGSL-3.2.2.2-010/030		D			
CSU-CDA-3.2.5-0040	FCDAS and WCDAS shall provide the capability to store Metop HRPT data for later processing and playback.	PGSL-3.2.2.4-110		D			

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				Ele	PGS	IJPS	
CSU-CDA-3.2.5-0050	The FCDAS shall provide the capability to retrieve and playback Metop GDS data.	PCDAS-3.3.1.1-140		D			
CSU-CDA-3.2.5-0060	FCDAS and WCDAS shall provide the ability to retrieve, playback and process Metop HRPT data.	PGSL-3.2.2.4-110 PCDAS-3.3.1.1-030		D			
CSU-CDA-3.2.5-0070	FCDAS and WCDAS shall provide the capability to retrieve all or selected subsets of the IJPS satellite data archived by that CDAS.	PCDAS-3.3.1.1-100 PCDAS-3.3.1.2-030/040		T,A			
CSU-CDA-3.2.5-0080	The FCDAS shall provide the capability to generate GDS backlog tapes, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.2-040		D			
	3.2.6 External Interfaces						
CSU-CDA-3.2.6-0010	FCDAS and WCDAS shall provide extracted MHRPT data to the CE, in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21].	PCDAS-3.3.1.1-030		D, A			
CSU-CDA-3.2.6-0020	The FCDAS shall provide extracted Metop GDS data to the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15]	PCDAS-3.3.1.3-030/040		D, A			
CSU-CDA-3.2.6-0030	The FCDAS shall provide Metop TM data to the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.3-030/040 PCDAS-3.3.1.4-070		D,A			
CSU-CDA-3.2.6-0040	The FCDAS shall provide the capability to forward to the CE time stamped Metop TM in real time.	PCDAS-3.3.1.1-070 PCDAS-3.3.1.4-070		D,A			
CSU-CDA-3.2.6-0050	The FCDAS shall provide Metop telecommand echoes to the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15).	PCDAS-3.3.1.1-090		D,A			

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				Ele	*PGS*	*IJPS*	
CSU-CDA-3.2.6-0060	The FCDAS shall receive Metop Telecommand data from the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDAS-3.3.1.1-090		D.A			
CSU-CDA-3.2.6-0070	The FCDAS shall provide the ability to support the restart of the Metop GDS transmission to the Suitland Interface, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PGSL-3.2.2.4-060 PCDAS-3.3.1.4-080		D			
CSU-CDA-3.2.6-0080	FCDAS and WCDAS shall interface with other PGS elements via the CE, in accordance with the NOAA IJPS System Requirements for Communication Services [AD-22].	PCDAS-3.3.1.3-030		D.,A			
	3.2.7 Performance						
CSU-CDA-3.2.7-0010	The FCDAS shall provide the ability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and one Metop satellite.	PGSL-3.2.2.1-010 PCDAS-3.3.1.1-020/040/050/080/090 PCDAS-3.3.1.3-010		T			
CSU-CDA-3.2.7-0020	The FCDAS shall provide the capability to simultaneously support data routing for one IJPS POES satellite and one Metop satellite.	PGSL-3.2.2.1-010 PCDAS-3.3.1.1-040/050/080/090/110/120/130/140 PCDAS-3.3.1.3-040		T			
CSU-CDA-3.2.7-0030	The FCDAS shall provide the capability to simultaneously support commanding for one IJPS POES satellite and one Metop satellite.	PGSL-3.2.2.1-010 PCDAS-3.3.1.1-040/050/080/090		T			
CSU-CDA-3.2.7-0040	The WCDAS shall provide the capability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and for one Metop satellite (L-band only).	PGSL-3.2.2.1-010 PCDAS-3.3.1.3-010		T			

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				Ele	PGS	IJPS	
CSU-CDA-3.2.7-0050	The WCDAS shall provide the capability to simultaneously support data routing for one IJPS POES satellites and MHRPT data routing and processing for one Metop satellite.	PGSL-3.2.2.1-010 PCDAS-3.3.1.1-030		T			
CSU-CDA-3.2.7-0060	The FCDAS shall successfully transmit 99.8% of the Telecommand received from the CE to Metop satellites over any 30-day periods.	PCDAS-3.3.1.1-040		T,A			
CSU-CDA-3.2.7-0070	FCDAS shall provide the capability to generate backlog tapes containing requested archived Metop GDS data within TBD of receiving the request.	PCDAS-3.3.1.2-030/040		T			
CSU-CDA-3.2.7-0080	The FCDAS shall time tag Metop TM data with an accuracy of better than 50 microseconds (TBC) of UTC.	PCDAS-3.3.1.1-070 PCDAS-3.3.1.4-070		T			
CSU-CDA-3.2.7-0090	The FCDAS shall time tag Metop GDS data with an accuracy of better than 100 microseconds (TBC) of UTC.	PCDAS-3.3.1.1-060 PCDAS-3.3.1.4-080		T			
CSU-CDA-3.2.7-0100	FCDAS and WCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the IJPS POES GAC acquired by that CDAS to the CE.	PGSL-3.2.2.4-050 PCDAS-3.3.1.4-090		T,A			
CSU-CDA-3.2.7-0110	CDAS performance requirement CSU-CDA-3.2.7-0100 shall be met when SAIP or STIP data is provided to the CE instead of GAC data.	PGSL-3.2.2.4-050 PCDAS-3.3.1.4-090		T,A			
CSU-CDA-3.2.7-0120	The FCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop TM acquired by that CDAS to the CE.	PGSL-3.2.2.4-070 PCDAS-3.3.1.4-070		T,A			
CSU-CDA-3.2.7-0130	The FCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop GDS acquired by that CDAS to the CE.	PGSL-3.2.2.4-060 PCDAS-3.3.1.4-080		T,A			

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				Ele	PGS	IJPS	
CSU-CDA-3.2.7-0140	FCDAS and WCDAS shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop MHRPT VCDUs extracted by that CDAS to the CE.	PGSL-3.2.2.4-110		T,A			
CSU-CDA-3.2.7-0150	FCDAS and WCDAS shall complete data processing for selected MHRPT VCDUs and delivery to the CE within TBD of the completion of the acquisition of the frame containing that data.	PGSL-3.2.2.4-110		T,A			
CSU-CDA-3.2.7-0160	The SOCC shall deliver MHRPT data to IPS within TBD of receipt.	NOAA requirement		T,A			
CSU-CDA-3.2.7-0170	TBD% of the IJPS global data sent to archive at a CDAS shall be retrievable.	PCDAS-3.3.1.2-030/040		T,A			
	3.3 Upgraded SOCC-Unique Requirements						
CSU-SOC-3.3-0010	The SOCC shall support the coordination with EUMETSAT necessary to ensure the day-to-day operation of each party's respective satellites and ground segment including contingency-support and blind orbit support tasks.	PGSL-3.2.2.1-010 PSOC-3.3.2.1-010 PSOC 3.3.2.2-040		D			
CSU-SOC-3.3-0020	The SOCC shall provide the capability to support operations in accordance with the JORP [AD-14].	PGSL-3.2.2.1-010		D,A			
CSU-SOC-3.3-0030	The Backup SOCC shall provide the capability to perform SOCC operational functions necessary to maintain the health and safety of IJPS POES satellites.	PSOC-3.3.2.1-025		D,A			
CSU-SOC-3.3-0040	The SOCC shall control the IJPS CE equipment located with in the SOCC.	PSOC-3.3.2.1-010/025		D			
	3.3.1 Monitor and Control						
CSU-SOC-3.3.1-0010	The SOCC shall provide the capability to configure and control SOCC hardware and software and CE resources located within SOCC to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.2-010		D			

Req't ID	*Req't Statement*	*Source Req't*	*Allocated Req't*	*Verification Level & Method*			*Comments*
				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.1-0020	The Backup SOCC shall provide the capability to configure and control Backup SOCC hardware resources to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0030	The SOCC shall provide the capability to remotely configure and control IJPS hardware and software resources at the CDASs.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0040	The SOCC shall monitor the status and control the IJPS hardware and software resources of the CDASs.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0050	Control of SOCC, Backup SOCC and the CE hardware and software shall be through a) automated execution of the schedule and/or b) manual commands.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0060	The SOCC shall provide IJPS operators the capability to monitor the real-time data quality of downlink acquisitions from Metop satellites.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			

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				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.1-0070	The SOCC shall provide the capability to configure PGS CDAS, SOCC and Communication equipment including any EUMETSAT-provided unique command, telemetry acquisition and/ or data acquisition equipment to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.1-150 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0080	The SOCC shall provide the capability to monitor the state of PGS SOCC, CDAS, and communication equipment and links including any EUMETSAT-provided unique command, telemetry acquisition and/ or data acquisition equipment to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDAS-3.3.1.1-150 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0090	The SOCC and Backup SOCC shall provide the capability to start/stop/reconfigure any real-time stream (data stream defined by data type, source and destination) in support of IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010		D			
CSU-SOC-3.3.1-0100	In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall have the capability utilizing the Darmstadt Interface to monitor NOAA-provided instruments on Metop Satellites.	PGSL-3.2.2.1-010 PSOC-3.3.2.1-200 PSOC-3.3.2.2-010/030		D			
CSU-SOC-3.3.1-0110	The SOCC shall provide the capability to monitor the performance of the Suitland Interface.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.3-010		D,A			

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				Ele	*PGS*	*IJPS*	
	3.3.2 Telemetry Processing						
CSU-SOC-3.3.2-0010	The SOCC and Backup SOCC shall provide the capability to ingest and process the IJPS POES satellite telemetry (TIP or AIP or HRPT) acquired and provided by EUMETSAT.	PSOC-3.3.2.1-025/150 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.2-0020	In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall provide the capability to access state-of-health telemetry data from NOAA instruments on Metop satellites.	PSOC-3.3.2.1-200 PSOC-3.3.2.2-030		D			
CSU-SOC-3.3.2-0030	The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry received through EPS resources from IJPS POES satellites, and telemetry received through PGS resources from POES (IJPS and pre-IJPS) satellites.	PSOC-3.3.2.1-025/150 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.2-0040	The SOCC and Backup SOCC shall provide the capability to extract MHS telemetry from IJPS POES TIP, AIP, HRPT and GAC data streams.	PSOC-3.3.2.1-025/180/190		D			
CSU-SOC-3.3.2-0050	The SOCC and Backup SOCC shall have the capability to manage extracted IJPS POES MHS telemetry and to provide such telemetry data to the EPS CGS.	PSOC-3.3.2.1-025/180/190		D			
	3.3.3 Trending and Analysis						
CSU-SOC-3.3.3-0010	The SOCC and Backup SOCC shall provide the capability to monitor and assess long-term trends in IJPS POES MHS parameters sufficient for anomaly detection and resolution and for nominal instrument command and control purposes.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			

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				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.3-0020	The SOCC shall provide the capability to assess CDAS, CE and the Suitland Interface quality of service for Metop blind orbit cross support.	PGSL-3.2.2.4-020/060 PSOC-3.3.2.3-010 PSOC-3.3.2.4-050/060		D			
	3.3.4 Commanding						
CSU-SOC-3.3.4-0010	The SOCC and Backup SOCC shall provide the capability to generate, validate, authenticate, and verify IJPS POES MHS instrument commands including real-time commands.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.4-0020	The SOCC and Backup SOCC shall provide the capability to command MHS instruments by utilizing PGS resources.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.4-0030	The SOCC and Backup SOCC shall provide the capability to command IJPS POES satellites by utilizing the commanding access provided by EUMETSAT through the EPS CGS.	PSOC-3.3.2.1-020/025/130 PSOC-3.3.2.2-060		D			
CSU-SOC-3.3.4-0040	The SOCC and Backup SOCC shall provide the capability to format and transmit commands to the IJPS POES satellites via the EUMETSAT CGS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-025/130		T,D,A			
CSU-SOC-3.3.4-0050	The SOCC and Backup SOCC shall provide the capability to ingest and process IJPS POES command echoes provided at the Darmstadt interface.	PSOC-3.3.2.1-025/140		D			
CSU-SOC-3.3.4-0060	The SOCC and Backup SOCC shall provide the capability to simultaneously command IJPS POES satellites using EPS resources and POES (IJPS and pre-IJPS) satellites using PGS resources.	PSOC-3.3.2.1-025/130 PSOC-3.3.2.2-020/060		T			

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				Ele	*PGS*	*IJPS*	
	3.3.5 Scheduling						
CSU-SOC-3.3.5-0010	The SOCC shall provide the capability to schedule FCDAS, SOCC and communication resources in support of Metop blind orbit and contingency support operations.	PSOC-3.3.2.1-010/050/060/070/080/091		D			
CSU-SOC-3.3.5-0020	The SOCC and Backup SOCC shall provide the capability to schedule PGS CDAS, operational SOCC, and communication resources in support of IJPS POES operations and Metop MHRPT data acquisitions.	PSOC-3.3.2.1-010/020/025/040/071/091/100/110/130/140/150 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.5-0030	The SOCC and Backup SOCC shall provide the capability to schedule the use of EPS CGS resources for IJPS POES blind orbit and contingency cross-support operations.	PSOC-3.3.2.1-010/020/025/040/130/140/150 PSOC-3.3.2.2-020/040/060		D			
CSU-SOC-3.3.5-0040	The SOCC shall provide the capability to schedule communication resources in support of acquisition of Metop GDS data from the Darmstadt Interface.	PSOC-3.3.2.1-025/030		D,A			
CSU-SOC-3.3.5-0050	In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall accept inputs for scheduling from EUMETSAT.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.5-0060	The SOCC shall provide the capability to utilize antenna RF masks and products from the Metop state vectors to schedule CSU Metop support activities.	PSOC-3.3.2.1-025/050/060/070/071/080/091/100		D			
CSU-SOC-3.3.5-0070	The SOCC shall make data available to EUMETSAT as specified in the JORP [AD-14].	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.5-0080	The SOCC and Backup SOCC shall provide the capability to create schedules that include activities for the management of health and status of IJPS POES MHS instruments.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			

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				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.5-0090	The SOCC and Backup SOCC shall provide the capability to produce and update schedules based on IJPS space and ground asset maintenance needs.	PSOC-3.3.2.1-010/020/025/ 030/040/050/ 060/070/080/ 090/100/110/ 120/130/140/ 150/160/170/ 190/210		D			
CSU-SOC-3.3.5-0100	The SOCC and Backup SOCC shall provide the capability to generate IJPS POES satellite stored command tables that include commands for MHS instruments.	PSOC-3.3.1-025 PSOC-3.3.2.2-010/020		D			
	3.3.6 Report generation						
CSU-SOC-3.3.6-0010	The SOCC and Backup SOCC shall provide the capability to generate reports used in the evaluation of PGS/IJPS performance.	PGSL-3.2.2.4-020/030/040/ 050/060/070/ 080/090/100/ 110 PSOC-3.3.2.1-025 PSOC-3.3.2.4-030/040/050/ 051/060/070		D			
CSU-SOC-3.3.6-0020	The SOCC shall provide the capability to compare and report the amount of expected data frames to actual data frames received for Metop downlink acquisitions at PGS CDASs.	PGSL-3.2.2.4-040/060/070/ 110 PSOC-3.3.2.4-050/051/060		D			
CSU-SOC-3.3.6-0030	The SOCC and Backup SOCC shall provide the capability to compare and report the amount of expected IJPS POES downlink data frames to actual data frames received through either PGS or EPS resources.	PSOC-3.3.2.4-040		D			
	3.3.7 Database maintenance						
CSU-SOC-3.3.7-0010	The SOCC shall provide the capability to exercise version control of operational databases for IJPS satellites (POES and Metop).	PSOC-3.3.2.1-120 PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.7-0020	The Backup SOCC shall provide the capability to exercise version control of operational databases for IJPS POES satellites.	PSOC-3.3.2.1-025/120 PSOC-3.3.2.2-010/020		D,A			

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				Ele	PGS	IJPS	
CSU-SOC-3.3.7-0030	The SOCC and Backup SOCC shall provide the capability for database administrators to modify IJPS POES operational databases for IJPS satellites.	PSOC-3.3.2.1-025/120 PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.7-0040	Operational databases shall support IJPS POES MHS instrument operations.	PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.7-0050	The SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites and two Metop satellites in addition to required pre-IJPS POES satellites.	PSOC-3.3.2.1-120 PSOC-3.3.2.2-010/020		T,A			
CSU-SOC-3.3.7-0060	The Backup SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites in addition to the required pre-IJPS POES satellites.	PSOC-3.3.2.1-025/120 PSOC-3.3.2.2-010/020		T,A			
	3.3.8 External Interfaces						
CSU-SOC-3.3.8-0010	The operational SOCC (SOCC or Backup SOCC) shall provide the capability to receive the IJPS POES telemetry acquired by EUMETSAT from the CE, in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-025/150 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.8-0020	The SOCC shall provide the capability to receive Metop ephemeris data from IPS.	PSOC-3.3.2.1-030/050/060		D			
CSU-SOC-3.3.8-0030	The SOCC shall make requested MHS Telemetry available to EUMETSAT at the Darmstadt Interface.	PSOC-3.3.2.1-190		D			
CSU-SOC-3.3.8-0040	The SOCC shall provide IJPS POES MHS Telemetry data in EUs.	PSOC-3.3.2.1-190		D.A			
CSU-SOC-3.3.8-0050	The MHS Telemetry data shall be made available in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-190		D			
CSU-SOC-3.3.8-0060	The SOCC and Backup SOCC shall be capable of a voice exchange with the EPS CGS.	PSOC-3.3.2.1-025 PSOC-3.3.2.3-030		D			

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Req't ID	*Req't Statement*	*Source Req't*	*Allocated Req't*	*Verification Level & Method*			*Comments*
				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.8-0070	The SOCC shall provide coordination data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21].	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.8-0080	The SOCC shall receive coordination data from IPS, in accordance with the Interface Requirements between CDAS, SOCC, and IPS in the IJPS Era [AD-21].	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.8-0090	The SOCC shall provide the capability to acquire one orbit buffer of IJPS POES Global data from the CGS Control Site in Darmstadt.	PSOC-3.3.2.1-040		D			
CSU-SOC-3.3.8-0100	The SOCC shall provide blind orbit Metop GDS data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21].	NOAA requirement		D,A			
CSU-SOC-3.3.8-0110	The SOCC shall provide blind orbit Metop GDS data to EPS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15]	PSOC-3.3.2.4-050		D,A			
CSU-SOC-3.3.8-0120	The SOCC shall provide MHRPT data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21].	NOAA requirement		D,A			
CSU-SOC-3.3.8-0130	The SOCC shall provide the capability to receive from the CE the IJPS POES global data that was acquired by EUMETSAT and provided to the Darmstadt Interface.	PGSL-3.2.2.1-221 PIPS-3.3.3.1-080		D			
CSU-SOC-3.3.8-0140	The SOCC shall receive blind-orbit IJPS POES global data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSYS-3.1.3-040 PSOC-3.3.2.1-040		D,A			
CSU-SOC-3.3.8-0150	The SOCC shall provide blind-orbit IJPS POES global data to IPS in accordance with the Interface Requirements between the CDAS, SOCC, and IPS in the IJPS Era [AD-21].	PGSL-3.2.2.1-221 PIPS-3.3.3.1-080		D,A			

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				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.8-0160	The SOCC shall provide the capability to generate IJPS POES global data backlog tapes in accordance with the NOAA Ground Segment to the EPS Ground Segment ICD [AD-15].	PGSL-3.2.2.2-060		D,A			
CSU-SOC-3.3.8-0170	The SOCC shall provide the capability to recover IJPS POES global data from backlog tapes provided by EUMETSAT.	PGSL-3.2.2.2-061 PSOC-3.3.2.2-080		D			
CSU-SOC-3.3.8-0180	The SOCC shall provide the capability to recover Metop GDS data from backlog tapes provided by EUMETSAT and deliver it to IPS.	PGSL-3.2.2-061 PSOC-3.3.2.2-080		D			
CSU-SOC-3.3.8-0190	The SOCC upgrade shall provide the hardware for the SOCC portion of the Suitland Interface.	PGSL-3.2.2.3-020		D,A,T			
CSU-SOC-3.3.8-0200	The SOCC shall provide IJPS POES global data to EPS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15]	PSOC-3.3.2.4-040					
	3.3.9 Performance						
CSU-SOC-3.3.9-0010	The SOCC and Backup SOCC shall provide the capability to simultaneously command two IJPS POES satellites utilizing two separate CDASs.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		T			
CSU-SOC-3.3.9-0020	The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry from two IJPS POES satellites acquired by two separate CDASs.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		T			
CSU-SOC-3.3.9-0030	The SOCC and Backup SOCC shall provide the capability to control CDAS, operational SOCC, and CE resources in such manner as to ensure that 99.4% (measured over any 30-day period) of the IJPS POES Global data acquired by the PGS is made available to the Suitland Interface in compliance with IJPS timeliness requirements.	PSOC-3.3.2.1-025 PSOC-3.3.2.4-040		T,A			

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Req't ID	*Req't Statement*	*Source Req't*	*Allocated Req't*	*Verification Level & Method*			*Comments*
				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.9-0040	The SOCC shall provide the capability to control CDAS, SOCC, and CE resources in such manner as to ensure that 99.4% (measured over any 30-day period) of Metop GDS blind-orbit data acquired by the FCDAS is be made available at the Suitland Interface in compliance with IJPS timeliness requirements.	PSOC-3.3.2.4-050		T,A			
CSU-SOC-3.3.9-0050	The SOCC shall provide the capability to control CDAS, SOCC, and CE resources in such manner as to ensure that 98.8% (measured over any 30-day period) of the TM downlinked by Metop to the FCDAS is made available to the Suitland Interface in compliance with IJPS timeliness requirements.	PSOC-3.3.2.4-060		T,A			
CSU-SOC-3.3.9-0060	The SOCC shall provide the capability to control CDAS, SOCC, and CE resources in such manner as to ensure that 98.8% (measured over any 30-day period) of the Metop TC provided at the Suitland Interface are successfully uplinked by the FCDAS to Metop in compliance with IJPS timeliness requirements.	PGSL-3.2.2.2-040		T,A			
CSU-SOC-3.3.9-0070	The SOCC and Backup SOCC shall provide the capability to reconstitute an IJPS GAC acquisition chain through a CDAS to the Suitland Interface in less than 360 minutes.	PSOC-3.3.2.1-025 PSOC-3.3.2.4-020		T,A			
CSU-SOC-3.3.9-0080	The SOCC shall provide the capability to reconstitute the GDS acquisition chain through the FCDAS to the Suitland Interface in less than 360 minutes.	PSOC-3.3.2.4-020		T,A			
CSU-SOC-3.3.9-0090	The SOCC shall provide the capability to reconstitute the Metop TM acquisition chain through the FCDAS to the Suitland Interface in less than 100 minutes	PSOC-3.3.2.4-031		T,A			

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				Ele	*PGS*	*IJPS*	
CSU-SOC-3.3.9-0100	The SOCC shall provide the capability to reconstitute the Metop TC transmission chain from the Suitland Interface through the FCDAS in less than 100 minutes.	PSOC-3.3.2.4-030		T,A			
CSU-SOC-3.3.9-0110	The SOCC and Backup SOCC shall provide the capability to reconstitute an MHRPT acquisition chain through a CDAS to the IPS in less than 360 minutes.	PGSL-3.2.2.4-110 PSOC-3.3.2.1-025		T,A			
CSU-SOC-3.3.9-0120	The SOCC and Backup SOCC shall provide the capability to control CDAS, operational SOCC, and CE resources in such a manner as to ensure that 99.4% (measured over any 30-day period) of the MHRPT data acquired by the PGS is made available to the IPS within timeliness requirements.	PGSL-3.2.2.4-110 PSOC-3.3.2.1-025 PSOC-3.3.2.4-051		T,A			
CSU-SOC-3.3.9-0130	The SOCC and Backup SOCC shall provide the capability to generate a conflict-free schedule for up to two IJPS POES satellites and one Metop satellite.	PSOC-3.3.2.1-010/025 PSOC-3.3.2.2-010		T,A			
CSU-SOC-3.3.9-0140	In accordance with IJPS GAC timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the IJPS POES Global data received from the CE.	PSOC-3.3.2.4-040		T,A			
CSU-SOC-3.3.9-0150	In accordance with GDS timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface 99.8% (measured over any 30-day period) of the Metop GDS received from the CE.	PSOC-3.3.2.4-050		T,A			
CSU-SOC-3.3.9-0160	In accordance with Metop telemetry timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface 99.8% (measured over any 30-day period) of the Metop telemetry received from the CE.	PSOC-3.3.2.4-060		T,A			

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				Ele	PGS	IJPS	
CSU-SOC-3.3.9-0170	In compliance with Metop TC timeliness requirements, the SOCC shall deliver to the CE 99.8% (measured over any 30-day period) of the Metop TC received at the Suitland Interface.	PGSL-3.2.2.2-040		T,A			
CSU-SOC-3.3.9-0180	The SOCC and Backup SOCC shall provide the capability to control CE resources in such a manner as to ensure that TBD% (measured over a 30-day period) of the Metop IASI, GRAS, ASCAT and GOME-2 products made available at the Darmstadt Interface are transferred to the IPS within timeliness requirements.	PGSL-3.2.2.3-020 PSOC-3.3.2.1-030		T,A			
CSU-SOC-3.3.9-0190	The SOCC shall deliver blind-orbit Metop GDS data to IPS within TBD of receipt.	NOAA requirement		T,A			
CSU-SOC-3.3.9-0200	The SOCC shall deliver blind orbit IJPS POES global data to IPS within TBD of receipt	NOAA requirement		T,A			
CSU-SOC-3.3.9-0210	The SOCC shall provide a data buffer for PGS acquired IJPS POES global data to contain, at all times, a minimum of one complete download.	PGSL-3.2.2.3-035		T,A			
CSU-SOC-3.3.9-0220	The SOCC shall provide a data buffer for blind-orbit Metop GDS data to contain, at all times, a minimum of one complete download.	PGSL-3.2.2.3-035		T,A,			
CSU-SOC-3.3.9-0230	The SOCC shall provide the capability to generate backlog tapes containing requested IJPS POES global data within TBD of receiving the request.	PGSL-3.2.2.2-060		T			
CSU-SOC-3.3.9-0240	The SOCC shall provide the capability to store at least seven days of IJPS POES global data for later playback.	PGSL-3.2.2.2-020/060 PGSL-3.2.2.3-031		T,A			
CSU-SOC-3.3.9-0250	TBD% of IJPS POES global data sent to archive at the SOCC shall be retrievable.	PGSL-3.2.2.2-060		T,A			

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				Ele	PGS	IJPS	
	3.3.10 Test and Training						
CSU-SOC-3.3.10-0010	The SOCC's and Backup SOCC's IJPS POES satellite emulation/simulation shall have the ability to receive command echoes provided by the EPS CGS.	PSOC-3.3.2.1-025/140		D			

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